ARCHITECTURAL RECORD

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SCHOOLS

MARCH 1948

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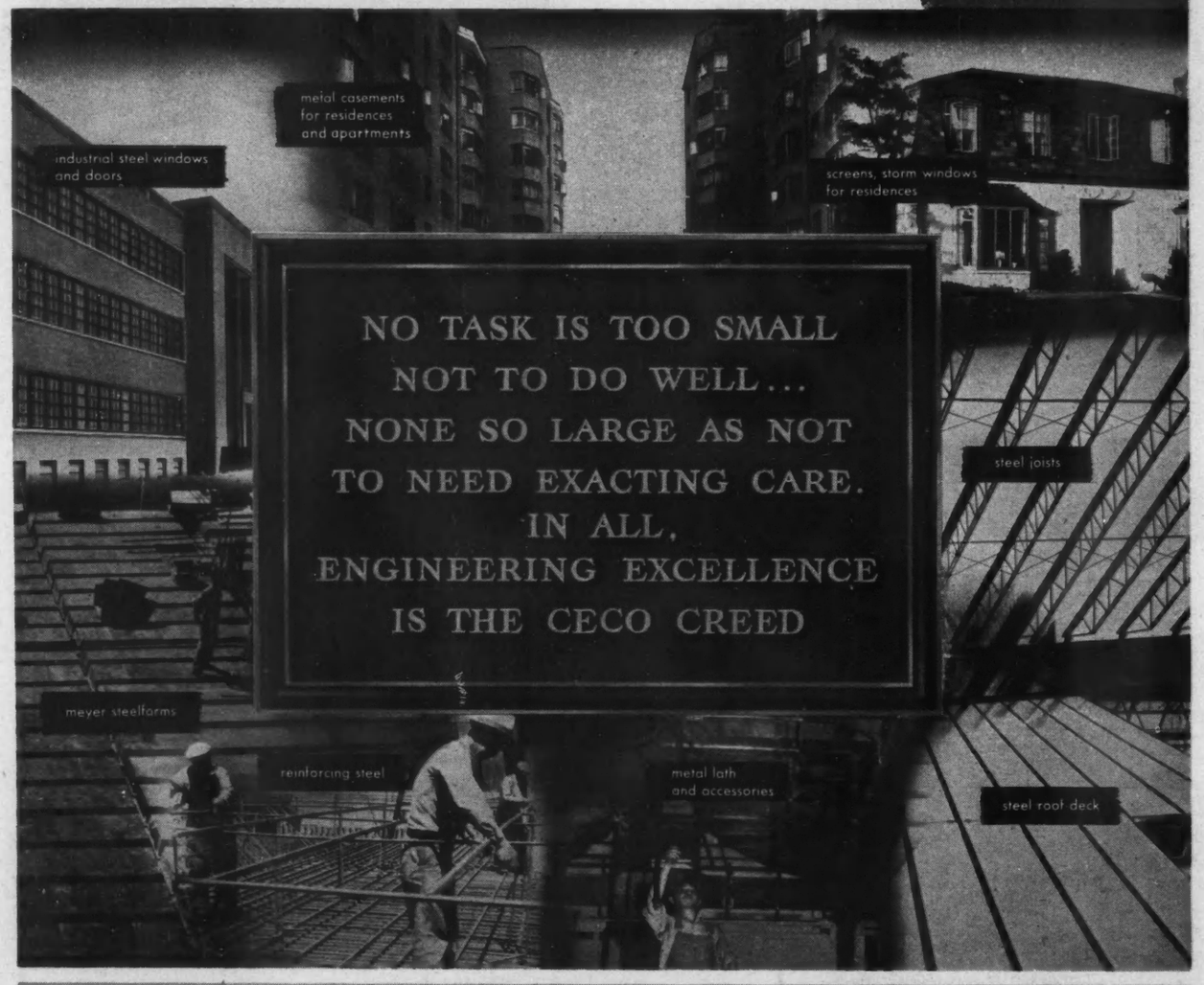

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CECO STEEL

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Two important modern developments were incorporated in Bennett Motor Company, automobile agency at Salt Lake City, Utah. The architects, Young and Hansen, utilized radiant heating to warm the structure, and a snow melting system to keep the driveway clear. Byers Wrought Iron pipe was used for both jobs, which were designed by Paul O. Huber and Rushby C. Midgley, engineers. A. H. Walsh Plumbing Company, the heating contractor, fabricated the coils.

INSTALLATION DETAILS

Grids were made from Byers 1¼-inch Wrought Iron pipe. The "herringbone" arrangement in the service-repair garage, clears pits and floor islands. Six individual grids were used to permit "zoning." Hot water supplied by a Pacific oil-fired boiler is circulated by Bell & Gossett pumps. Fulton Sylphon controls govern operation.

Sinuous coils were used in the snow melting system. Hot water is circulated through these coils as soon as snow or sleet appears, keeping driveway and sidewalk clear.

SOLVES DIFFICULT PROBLEM

Radiant heating has won wide acceptance for garage heating. It eliminates cold floors . . . and any snow or wet "tracked in" by cars is speedily evaporated. Further, the effect of drafts from frequently-opened doors is minimized. Snow melting is receiving an equally warm welcome because of its demonstrated effectiveness.

ENGINEERING APPROVAL

Wrought iron pipe offers an unusual combination of advantages for installations like these. It is easily formed and welded . . . it has high heat emission . . . it expands and contracts at equal rates with concrete and plaster . . . and it had proved its corrosion resistance in all types of applications.

WANT MORE INFORMATION?

You'll find full information in our bulletin, "Byers Wrought Iron for Radiant Heating". Ask for it.

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Vol. 103 • No. 3 March 1948

ARCHITECTURAL RECORD

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Selecting FLUSH VALVES FOR SCHOOLS

IN THE selection of flush valves for school buildings there is one particular feature of design — the adjustable feature — which is receiving increasing attention. Two recent unbiased surveys made among architects and plumbing contractors bear this out.

These surveys show that the overwhelming majority agree that flush valves should be adjustable to actual fixture requirements, for maximum water economy and lasting efficiency. Architects — the men who specify flush valves — favored the idea 7 to 1; plumbers — those who actually put flush valves to work — voted 20 to 1.

It was Watrous who first pioneered this idea. Today all Watrous Flush Valves are adjustable. Further evidence of the far-ahead Watrous design is shown in the single-step servicing feature, which simplifies and speeds maintenance.

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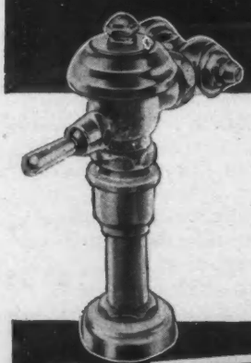
Wyandotte High School, Kansas City, Kans., Watrous equipped. Hamilton-Fellows & Nedvid, Chicago, Architects. J. W. Radotinsky, Kansas City, Kans., Assoc. Architect. Interstate Heating and Plumbing Co., Kansas City, Mo., Plumbing Contr.

Lake Placid High School, Lake Placid, N. Y., equipped with Watrous Flush Valves. H. O. Fullerton, Albany, N. Y., Architect. A. J. Eckert Co., Inc., Plumbing Contractor.



ARCHITECTS' VIEWS ON FLUSH VALVE APPLICATIONS

A survey of interesting trends in the selection of flush valves for postwar schools is given in Bulletin No. 477. Write for your copy. See Sweet's Catalog for full information on Watrous Flush Valves.

THE IMPERIAL BRASS MFG. CO., 1240 W. Harrison St., Chicago 7, Ill.

Watrous Flush Valves

THE RECORD REPORTS

Building Industry Scheduled to Benefit from Voluntary Allocation of Steel • More Housing Is Congressional Cry • Lumber Prices Studied

The building industry is scheduled to benefit from the voluntary allocation of steel to essential users arranged under a recent statute — but schedules of this kind are not guaranteed to do much. In a series of meetings with the Commerce Department, the steel industry agreed, among other things, to provide more of its product to residential construction. The passage from conferences and verbiage to live business isn't smooth.

Companies are expected, after putting aside additional steel for housing, to allocate more of the product to specific companies in the building line. Contractors in turn must pledge to use the steel as promised. Turning such an arrangement into a simple business routine is obviously complicated. For instance, companies did not agree, and indeed couldn't, to honor every purchase order by anybody connected with building. They must scale down and discriminate. What is clear is that government won't take over the job of expediting purchase orders.

Insofar as it does work, the agreement will bring more steel to the nail makers, more pig iron to makers of soil pipe, etc. It will widen, at least a jot, the more conspicuously narrow bottlenecks.

Secretary Harriman tells newspapermen that agreements are sought among other suppliers of residential builders. But steel alone holds a reasonable promise. Here, after all, there are but a few companies and the representatives of these can be collected into the Commerce Department auditorium. In the case of lumber, there are too many operators. Incidentally, the Congressional Committee is more optimistic about this material and points with pride to the price cut by the leading lumber company — following, it is said, some committee work.

Loan Insurance to Change?

One aim of the Federal agencies now is to strengthen the permanent housing programs and to pull gradually away from special postwar credits such as the loan guarantees under the veterans' measure.

Note that President Truman advised the Congress that, if it extends the emergency mortgage insurance program beyond March 31, such extension should be for a limited period and that the program should be "progressively curtailed." He also wants to avoid possible excessive mortgage credit through the Federal Savings and Loan Insurance Corporation.

A Congressional Joint Housing subcommittee, on the other hand, proposes extension of the insurance of loans to housing manufacturers, and suggests enlarging its scope. Further, it advises amending the National Housing Act to "provide government aid for financing planning, plant and equipment, and working capital for large-scale projects."

Wants Industry Revamped

This subcommittee, headed by Senator Ralph E. Flanders of Vermont, recommends reorganizing the housing industry on a modern industrial basis with Congress encouraging large-scale site and construction and factory production of houses. Among cost-reduction techniques it cites standardization of sizes and expansion of Bureau of Standards facilities for research and testing to encourage new methods of production and use of satisfactory new materials.

The Vermont Senator goes further, advising that the Federal Trade Commission and the Department of Justice should be instructed to "prosecute and police vigorously" those distributors, wholesalers, etc., in the industry who engage in practices in restraint of trade. HHFA, he says, should be charged with promoting a model building code while FHA should eliminate its building requirements which add unnecessarily to construction costs. He favors creation of a housing advisory council to work with HHFA.

A probe of high profit margins, efforts by ODT to redistribute freight cars for critical building materials, voluntary allocation programs and stepping up apprentice training programs are other points raised by Senator Flanders as a result of his subcommittee findings. Calling attention to criticism of the traditional methods of building material distribution, he says that, while small builders will need regular distributors, the present system is unsuited to large-scale construction operations.

Federal Plans Detailed

The federal budget, as it came from the President and before the Congress started carving it up, included estimates for long-range housing assistance to private enterprise and local public agencies. The goal is, in the President's words, to "prepare the way for later expansion in loans and grants for low-rent housing, urban redevelopment and farm housing; for insurance of direct investments in large-scale rental housing and for basic technical and economic research."

The budget also covers sale and management of war housing with expenditures upped on low-rent projects for pur-

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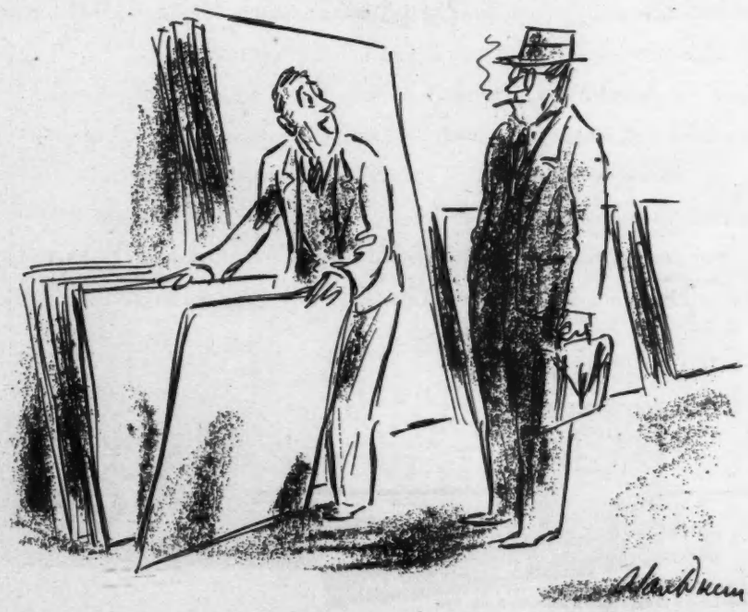

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— Drawn for the RECORD *by Alan Dunn*

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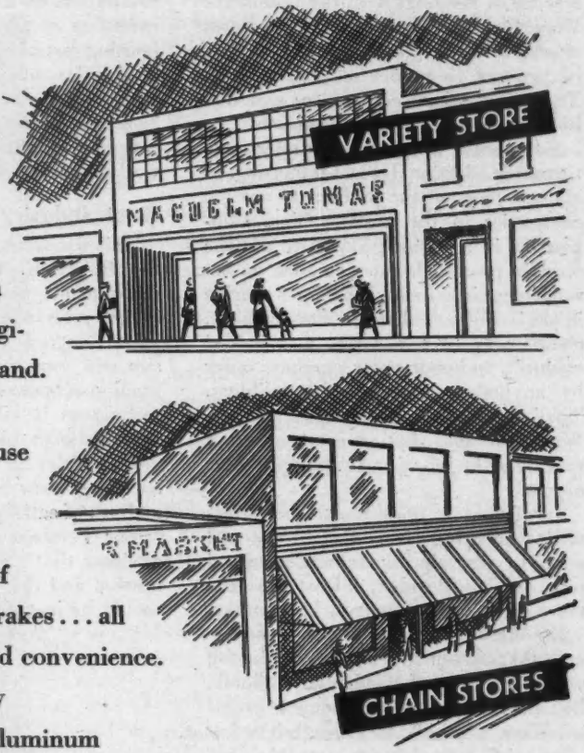

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THE RECORD REPORTS

(*Continued from page 7*)

chase of local housing authority obligations to place war-built projects on a permanent basis.

Role for Public Works

Authority for further Federal Works Agency advances to states and localities to plan community facilities also is sought. Legislation for this expired last June 30. Under the proposal a total expenditure of $10,000,000 would be in order for the 12 months beginning next July. Otherwise, except for road building, which moves up roughly $200 million, FWA funds are about the same as for the current fiscal year.

The so-called civil public works are expected to reach $2.8 billion next year compared to $2.0 billion in the current fiscal year and $1.4 in 1947. Covered are six large programs:

1. Construction of veterans' hospitals.
2. Navigation and power projects of the Corps of Engineers.
3. Irrigation and power projects of the Bureau of Reclamation.
4. Construction of the production, research and housing and community facilities for the expanding atomic energy program.
5. Grants for highway construction.

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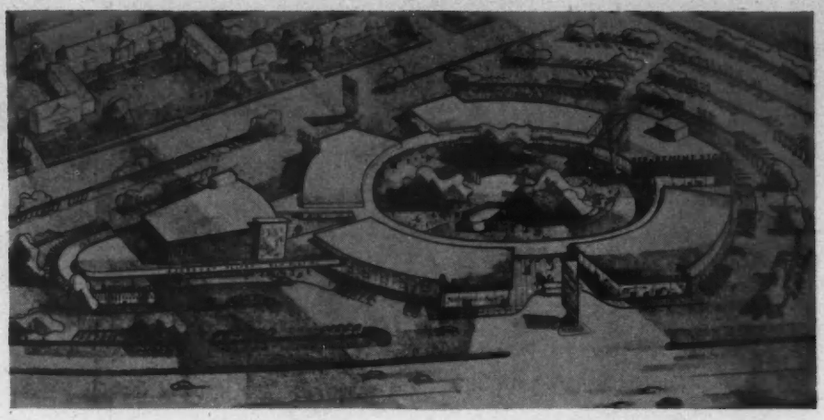

Circular shopping center planned by Joseph J. Brunetti for Maywood, N. J. will include about 40 shops, a department store and theater. Kelly and Gruzen, Architects

BUILDING NOTES

Shopping Center

Plans for a $4,500,000 shopping center at the entrance to Maywood, N. J., have been announced by Joseph J. Brunetti, who will build and own the project as a permanent personal investment. The center will cover 14.5 acres, and will be located in the heart of a community of apartments, housing 600 families, which is also a Brunetti development.

The shopping center, plans for which have been drawn by Kelly and Gruzen, New York architects, will include a 2-story department store, a 1500-seat theater, restaurant, supermarket, furniture store, bowling alleys, and a total of 40 shops. Main entrances of the stores will be arranged about a circular court, closed to automobile traffic. Parking is provided around the entire perimeter of the center, accommodating 800 cars.

Apartment Project

Early January saw the start of a new metropolitan New York apartment development in Bayside, Queens. Known as the Rocky Hill Garden Apartments, the project will consist of 18 buildings and 234 units ranging in size from two

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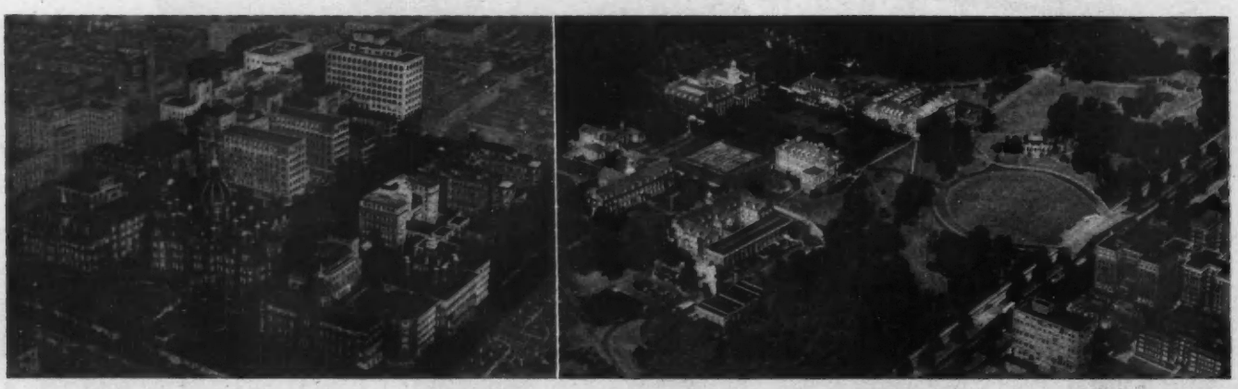
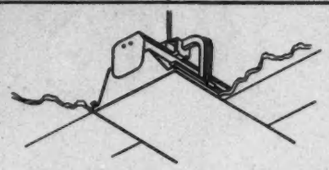
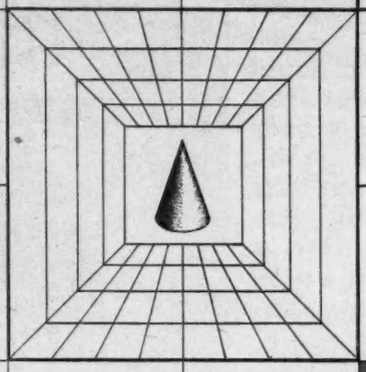


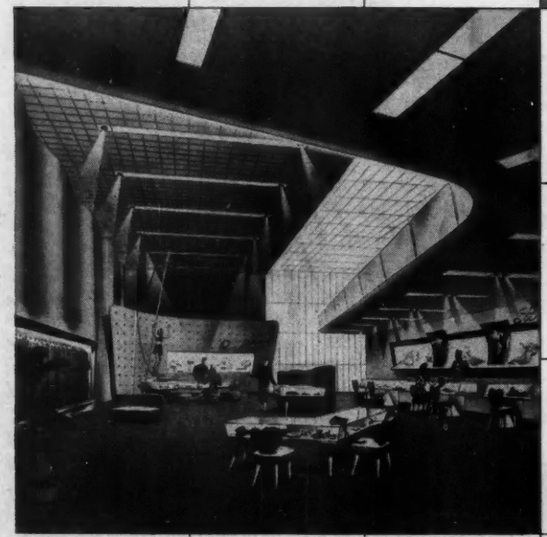
JOHNS HOPKINS AND JOHNS HOPKINS: Left, The Johns Hopkins Hospital, Baltimore; right, The Johns Hopkins University, Baltimore, an independent institution. The two views are reproduced to correct an error which crept in during preparation of Dean Hudnut's article on "Form in Universities" (December, 1947). Where the text was made to refer to the "university" obviously the real reference was to the hospital group, which was pictured on page 88. Dean Hudnut's intention did effectively register, however. Reginald Isaacs, Planning Director of the Michael Reese Hospital in Chicago, wrote, "the paper is excellent and much of it can be applied to the planning of large hospitals and medical centers. I should like . . . forty reprints for . . . my Board." Our thanks to James Kellum Smith of McKim, Mead & White (Chairman, the Advisory Board of Architects, The Johns Hopkins University) for pointing out the error. Lynn Poole, Public Relations Director of The Johns Hopkins University, writes: "Our campus is not the monastic Gothic, which can be depressing —nor is it sleekly modern, which can become incongruous. We think it hits that clichéd happy-medium." Apartment builders were persuaded to conform also by "Georgian" treatment of their cubical forms

light . . . with versatility of installation offering CEILINGS UNLIMITED*





Installation simplified by Miller Ceiling Furring Hanger (patented). Continuous wireway cuts wiring, fitting costs. Units Bonderized, resist rust. Accessible parts—easy service.



ladies' apparel store—architect morris lapidus, new york

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2

These are the BEST

— without a doubt — the finest line of flood-lighting units ever to bear the famous SILV-A-KING label. And for a company which has enjoyed the reputation that has been SILV-A-KING'S for over a quarter-century — that's a lot.

ISLAND LIGHT

Life-time porcelain enamel Reflector. Cast aluminum support and top housing. Lamp mounted base up. All wiring encased.

SPORT AREA

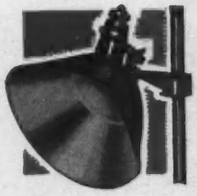
Alzak aluminum floodlight. Calibrated for vertical and horizontal adjustments.

SUPER SERVICE

Life-time porcelain enamel floodlight. Calibrated for vertical and horizontal adjustments. Enclosed wiring bracket illustrated.

UNI-FLOOD

Life-time porcelain enamel floodlight. Swivel joints for complete adjustments. Open wiring bracket illustrated.



UTILITY

Floodlight of seamless, one-piece heavy-gauge aluminum. Swivel joints allow complete adjustment.

NEW CATALOG

For the complete line of SILV-A-KING Flood-lighting Units, and all other Incandescent Reflectors, send for free Catalog #50.

BRIGHT LIGHT REFLECTOR CO.

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SILV-A-KING

THE RECORD REPORTS

(*Continued from page 10*)

to four and a half rooms. Construction will be of brick with steel support.

Heating will be by a forced hot water system using three Pacific boilers, each of which has a capacity of 21,250 sq. ft. of radiation. A semi-tankless hot water supply will be installed, and each building will be provided with automatic washing machines and automatic dryers.

Architect for the project is Nathan A. Seidermann; contractors and builders are Lewis & Kirmse.

The 26-story office building for the John Hancock Mutual Life Insurance Company, in Boston. Cram & Ferguson, Architects

New Office Building

Now under construction in Boston, Mass., is a new 26-story office building for the John Hancock Mutual Life Insurance Company. To provide facilities for 5000 employees, the structure will be completely air conditioned, will include an auditorium seating 1132. Architects are Cram & Ferguson.

Among the many unusual features of the building will be electric stairways and an entire floor for off-hour recreational facilities. All windows will be of Thermopane insulating glass.

The first eight floors of the building will be served by electric stairways with a rated capacity of 8000 passengers an hour. During rush periods, in the morning and evening, the equipment can be operated in one direction, carrying twice that number per hour. Automatic conveyor systems will be used to shunt mail among the various departments and floors.

Flexibility is the keynote of the working areas. Steel, prefabricated, interchangeable walls will make it possible to

(*Continued on page 14*)

NEW! A better building material at no increase in cost!

One look at this new Kaiser Aluminum clapboard Siding and Roofing and we think you'll agree—

it is better looking, stronger, more weathertight, more durable than any other siding and roofing on the market!

We *know* that to be a fact, because our engineers investigated every known design in order to select the one that proved itself *superior* on every count.

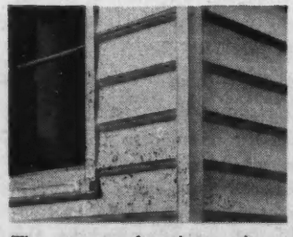
Made of full hard Kaiser Aluminum, each section is absolutely uniform. When nailed down, the curved surface creates a tension which results in a *weatherproof lock!* No other siding has this feature!

Prime-coated for painting, it easily takes finishing coats... in fact, the appearance of paint is enhanced. And you save costs all down the line. On handling, erection, nails, paint, and elimination of waste.

Today—wire, write, or phone any Permanente Products' office below for a free folder giving all the facts!

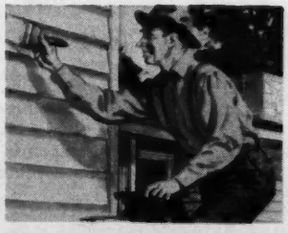
Kaiser Aluminum

SIDING AND ROOFING

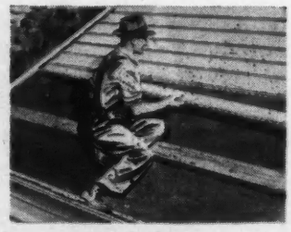


The concave surface gives maximum strength, ultimate rigidity, provides deep shadow lines.

Applied from top to bottom, each section locks with a spring action, assures weather tightness, no rattles.



Gives on-the-job savings in labor, nails, paint, elimination of waste. Can be worked with regular wood tools.



Roofing has all the features of the siding and can be applied at lower cost than shingles.

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SOLD BY PERMANENTE PRODUCTS COMPANY, KAISER BLDG., OAKLAND 12, CALIFORNIA . . . WITH OFFICES IN:

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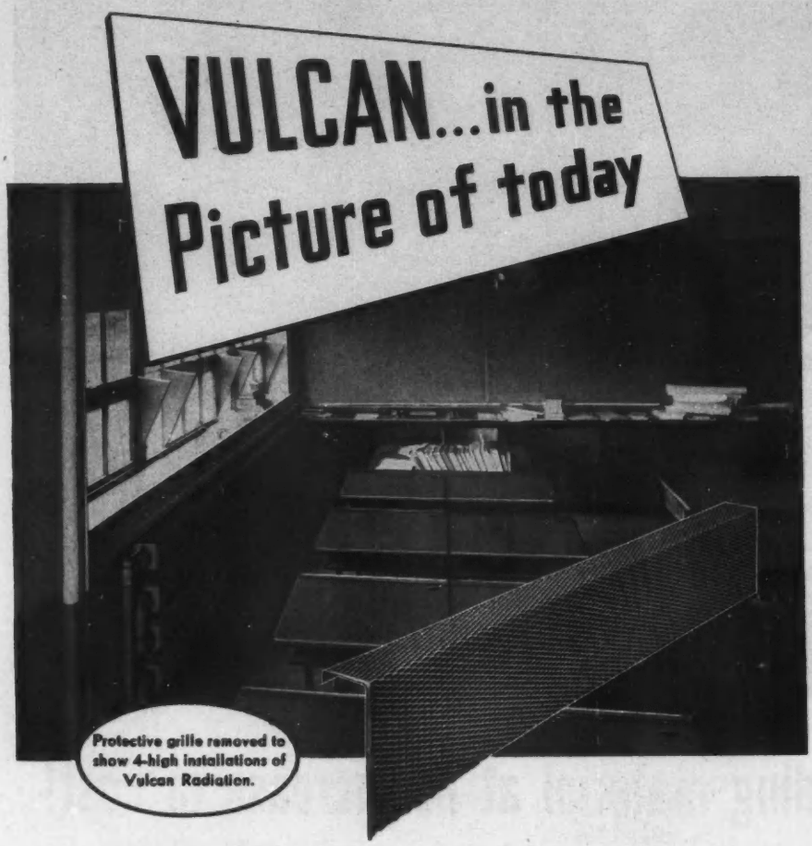
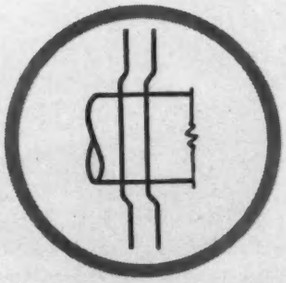


Vulcan continuous line radiation installed beneath the window area of schoolroom provides a protective blanket of convection heat, minimizes cold-air drafts dangerous to health. Note its compactness . . . allowing for greater room utility. A neat, protective grille further adds to the attractiveness of the installation.

Yes, Vulcan radiation plays an important part in today's up-to-the-minute heating. Its versatility has made it the approved modern installation not only in schools but in ships, trains, homes, hospitals, public buildings and industrial plants.

Vulcan is light in weight yet rugged in construction . . . is easily installed in any type room or space . . . responds quickly to heating controls.



Look for the name "Vulcan-Hartford" stamped on every radiator.

More heat in less space. Vulcan patented offset fin construction with fins mechanically imbedded in pressure tube extends heating surface . . . gives complete rigidity to entire assembly.

THE VULCAN RADIATOR COMPANY

26 FRANCIS AVE., HARTFORD 6, CONN.

RADIATOR MANUFACTURERS FOR OVER TWO DECADES

THE RECORD REPORTS

(*Continued from page 12*)

rearrange an entire group of offices overnight without interruption of normal operations. Use of a patented steel flooring will permit installation of an electrical outlet at every 6 in. of space.

The "employees' floor," the eighth, will be devoted entirely to lounges, recreation and game rooms, a shop handling small items, and a library. Dining rooms and cafeterias capable of serving 4000 employees in four sittings will be located on the seventh floor.

Newspaper plant and radio station nearing completion in Louisville is really two buildings, but gives appearance of one

Newspaper Plant

The new plant for the *Louisville* (Ky.) *Courier-Journal* and *Louisville Times* is rapidly nearing completion, as shown by the above photograph.

The plant is of contemporary design, and, while giving the appearance of one building, is really two independent structural units. The 7-story front portion will house the non-mechanical departments and radio facilities for Station WHAS; the 4-story rear section will be given over to the presses and other mechanical equipment. Both have limestone and granite exteriors, but the office unit is of steel frame, fireproofed construction and the mechanical unit of flat slab concrete. Lockwood Greene Engineers, Inc., of New York are architects-engineers for the project.

Prefabricated Village

A complete village of 100 homes is being shipped by truck to the U. S. Atomic Energy Commission installation at Los Alamos, New Mexico. The units are Wingfoot Homes — portable two-bedroom houses manufactured by the Goodyear Tire and Rubber Company's housing subsidiary at Litchfield Park, Ariz.

The houses are completely equipped, with wiring, plumbing and fixtures installed, and built-in beds, lockers, kitchen cabinets, etc. Floor area is approximately 255 sq. ft.

"I put certified adequate wiring in my homes because that certificate identifies me as a reputable builder. I plan to be in business long after the present housing shortage is over and forgotten," says Angus G. Wynne, Jr., Prominent Dallas builder.

The sign of the times is . . .

"Certified Adequate Wiring"

PROOF ADEQUATE — another home-building project featuring Certified Adequate Wiring —the Wynnewood development in Dallas, Texas.

What It Means To You: Certified Adequate Wiring makes today's home buyers tomorrow's boosters. It helps you build houses that stay modern for years to come. It helps you sell houses easier and quicker because: (1) it overcomes today's buyer resistance; (2) it assures you of promotional support from your local electrical industry.

What It Means To The Home Buyer: Adequate Wiring makes even a moderate-cost house, or a remodeled home, *modern*. It provides not only for today's electrical needs but for those of tomorrow—including such things as kitchen and laundry appliances which can be covered by a "packaged mortgage."

What "Adequate Wiring" Means: An adequate electric service entrance; enough circuits, enough convenience outlets; permanent lights and switches.

Here's What You Can Do About It:

1. Use the services of your local Adequate Wiring Bureau in preparing complete wiring layout for every floor plan.

2. Install Adequate Wiring in accordance with this layout.

3. Obtain your "Proof Adequate"—a certificate to present with each deed.

4. If there is no Adequate Wiring Bureau in your area, *write us* for details of how to take advantage of "Adequate Wiring" as a sales feature.

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CLIP AND MAIL TODAY for *free information and material!*
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Please send me, without charge, information on how to take advantage of Adequate Wiring as a sales feature.

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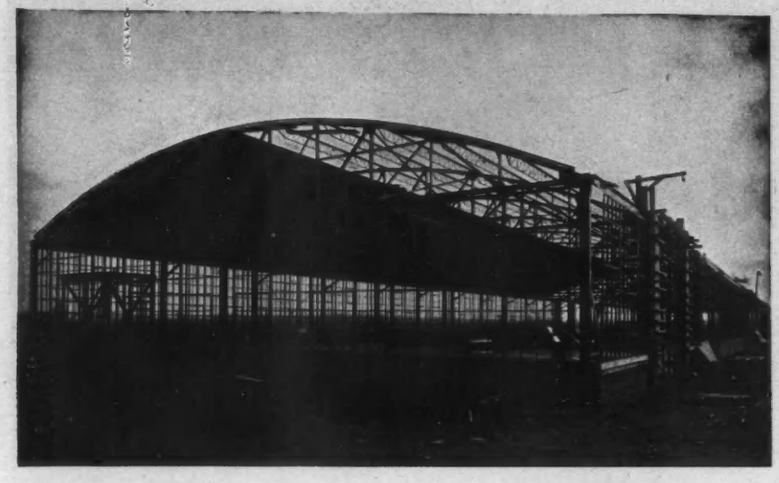
Riveted *for Safety*



Bowstring Trusses *by*

MESKER STEEL Evansville

RIVETING in truss fabrication means positive security and above all simplicity in the finer phases of steel construction.

The Bowstring Truss, a truly original Mesker development, provides greater strength and flexibility to meet every requirement of industrial or commercial construction, wherever clear floor space is required.

THE Mesker Bowstring Truss design eliminates columns. Greater floor space and the resulting finer appearances are but another feature of Mesker design. Mesker in truss fabrication, means safety, means better and standardized construction.

Mesker Steel prefabricated products are superior in every field — a true fact you expect from one of the oldest fabricators in the country.

WRITE TODAY FOR CATALOG AND FREE DESIGN INFORMATION

GEO. L. MESKER STEEL CORP.
EVANSVILLE 8, INDIANA

THE RECORD REPORTS

(*Continued from page 10*)

6. Loans of REA for rural electrification lines.

Added to these six are contemplated outlays for airports, the hospital aid program and TVA.

Tax Incentives for Housing

In a study of the relation of taxes to housing, Senator Charles W. Tobey of New Hampshire advises against the assumption that local real property tax exemption will substantially reduce dwelling costs or rentals. In a report to the Congressional Joint Housing Committee, he questions also the proposal to give federal tax exemption to funds invested in housing, stating that this could potentially involve $24 billion and establish a precedent for exempting other fields of investment.

His subcommittee analysis of proposals before Congress carries these pointed comments:

"With one exception, the proposals analyzed would produce housing renting at levels suitable for middle-income families. Only the low-rent public-housing formula, involving direct annual federal subsidies and local tax exemption, would reduce rents sufficiently to meet the requirements of the average family in the lowest income third.

"Local real property tax exemption by itself has only a limited effect in reducing the monthly costs of housing. . . .

"Some of the proposals involving federal guaranties or loans would present the possibility of substantial additional federal costs as a result of capital losses.

"Those of the proposals which would achieve substantial reductions in rents combine different types of tax subsidy with other devices."

Home Sites and Design

Land redevelopment and home design keep getting scrutiny in Washington. For one thing, Congressional probings bring to light, besides the headline-getting gray markets, suggestions for cost reduction by care in selecting sites and by street layouts intended to reduce street and utility installation costs. Savings, too, are stressed in placing plumbing, heating, cooking and refrigeration units near each other to curtail labor charges and reduce use of scarce pipe, wire and electric fixtures. HHFA, as previously noted in the ARCHITECTURAL RECORD, recently published results of its planning studies. The National Capital Housing Authority has found that the most economical type of housing, both to construct and manage, is the two-story, one-family house built in groups or rows.

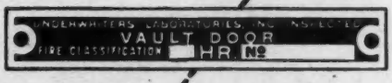
(*Continued on page 18*)

2 4 6 Hours

HHM Double Door VAULT ENTRANCES
provide the required degree of

CERTIFIED PROTECTION

for valuable records



Extra Margins of **SAFETY!**

RELOCKING DEVICE! Extra safety feature that automatically locks the bolts when forced entry is attempted. Lower burglary insurance rates 10%.

ESCAPE DEVICE! A life and death necessity that enables anyone locked in the vault to get out easily and quickly.

Herring-Hall-Marvin insulated flat sill *double door* vault entrances give you the choice of any degree of certified fire protection . . . plus the extra convenience of a wider entrance, full 42" clearance for easier movement of record buses and trucks.

To help you decide the type of equipment needed for any particular job, call in a Herring-Hall-Marvin representative, a specialist in this field.

Without obligation, he will survey your client's needs and make a detailed recommendation to you.

Write, wire, or phone today.

See our catalogue 24/4 in your Sweet's File for detailed information on certified vault entrances and installation.

HERRING · HALL · MARVIN SAFE CO.

Herring-Hall-Marvin Storage Room Entrances offer 1-hour and ½-hour fire protection for use where the record volume is too large and the records not sufficiently important to warrant specifying the greater protection of a vault.

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Planning a

Chemical Plant Oil Refinery Paper Mill?

...or an addition?

You can now get ASBESTONE

Asbestos-Cement Corrugated Roofing & Siding

—the lifetime roofing and siding that's fireproof and corrosion-proof. Asbestone can't be damaged by weather, rats, or termites. No painting. No upkeep.

Here are a few of the many prominent users:

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UNIVERSAL ATLAS CEMENT CO.

Why we can assure you early delivery

We are concentrating on production of this single industrial product. Stocks are now ample to make some immediate shipments. Free Engineering Service, available on request, shows how Asbestone can be adapted to your needs.

ASBESTONE CORPORATION

5300 TCHOUPITOULAS STREET NEW ORLEANS 15, LA.

Specialists in Asbestos-Cement Building Products for over 25 Years

THE RECORD REPORTS

(*Continued from page 16*)

Lumber Prices Analyzed

With lumber among question marks in the housing picture, the Commerce Department's Construction Division, in an analysis, finds that lumber costs have increased from an average of 19 per cent of the total selling price of an average house in 1939 to 26 per cent in November, 1947. According to its study, an average house went up in price to the buyer from $4440 in 1939 to $9060 last November, representing a jump in average selling price of 104 per cent. Lumber costs in this typical house, says the Division, show an estimated increase of 183 per cent. For the period from last June to last November, it says, the selling price of the house moved up 6 per cent while lumber costs rose 12 per cent.

Research Continues

Research developments on new materials carried on through federal agencies include a project for "spandrel" wall panels to be used in multi-story construction. CD's Office of Technical Services tells of this, a lightweight "sandwich" of metal and insulating materials with many times the insulating value of masonry in a thickness only a fraction as great and weighing considerably less.

OTS also tells of another project in collaboration with industry to build comfortable and adequate, but low-cost, basementless homes. Study covers mixes and formations to temper ground and atmospheric effects. Assumption is that an adequate solution to the problem will save $1000 on home cost.

The National Bureau of Standards is proceeding with research on the strength of constructions, fire resistance, heating and air conditioning, water proofing and construction standards. It is paying particular attention to lighter forms of construction and problems of maintenance.

Other Developments

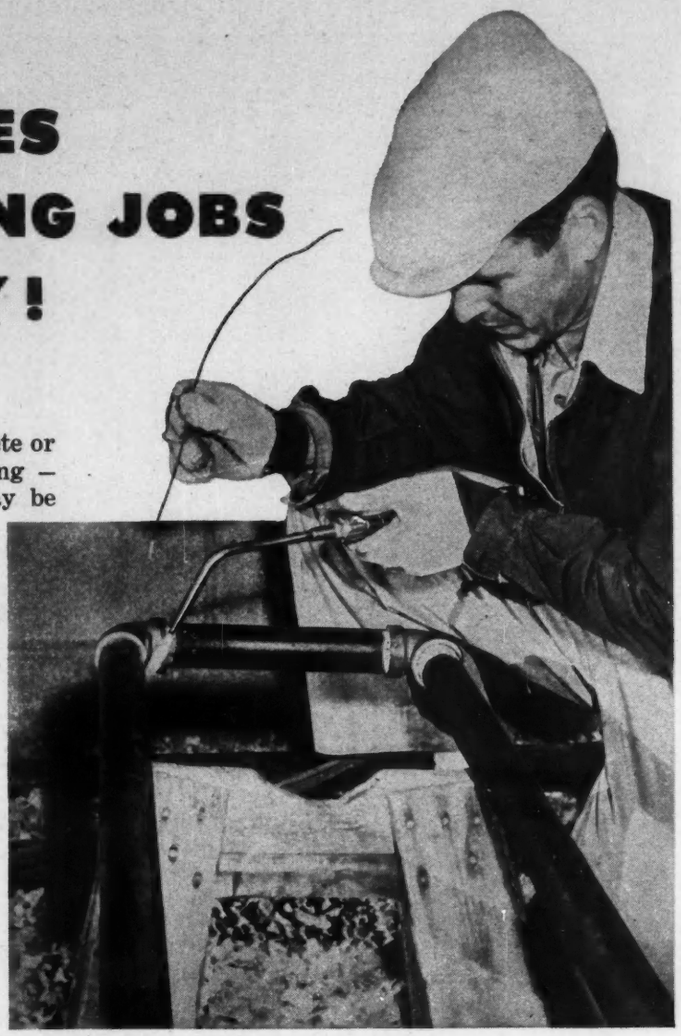
Other developments in building:

1. From Chairman Ralph A. Gamble, of the Congressional Joint Committee on Housing, comes word that under the U. S. Housing Act there are more than $106 million in housing loan commitments that have been held up largely because cost of completion would exceed limits set under the Act. He urges efforts to utilize such "frozen" land and structures. Involved are 17,649 urban and 6460 rural dwelling units.

2. The Atomic Energy Commission will carry out a sizable construction program, including new laboratory facilities, permanent replacement of temporary wartime structures and moderniza-

(*Continued on page 20*)

MAKES TOUGH PIPING JOBS EASY!



FOR piping that *has* to last – buried in concrete or enclosed in partitions, as in radiant heating – Flagg-Flow *Threadless* Malleable Fittings may be installed and safely forgotten.

- For piping in hard-to-reach spots – in corners, against walls, or around machinery – Flagg-Flow can be used wherever pipe will go.
- For piping subject to vibration, expansion or contraction, Flagg-Flow joints are stronger than the pipe itself.
- For any piping, Flagg-Flow gives new freedom of layout and ease of installation.

Here's why

Silver brazing alloys flow by capillary action to permanently bond pipe and fitting into "one-piece" security. There's no space needed for wrench clearance, no special position required for brazing. Finally, there's no fear of "leakers", for Flagg-Flow are the only stock 150-pound malleable fittings air-tested under water.

YOURS FOR THE ASKING is a profusely illustrated catalog giving complete information on Flagg-Flow, the *threadless* malleable fitting about which the whole country is talking.

Independent laboratory tests prove that Flagg-Flow joints are stronger than the pipe itself. Illustrated is a torsion test. In a tensile test, the pipe failed at 65,000 pounds per square inch without harming the joint.

FLAGG FF FLOW

Pipe Fittings Since 1854

STANLEY G. FLAGG & CO., INC.

1421 Chestnut Street, Philadelphia 2, Pa.

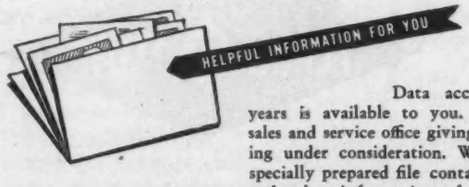
MALLEABLE IRON FITTINGS, STD. EX. HVY. AND AAR • CAST IRON FITTINGS • DRAINAGE FITTINGS • FLANGE UNIONS • FLANGES
GROUND JOINT UNIONS • BRONZE THREADED FITTINGS • BRONZE SOLDER FITTINGS • UNDERGROUND TANK FITTINGS

GEORGIA MARBLE—THE MODERN BUILDING MATERIAL

Emanuel County Courthouse, Swainsboro, Ga.
Dennis & Dennis, Architects, Macon, Ga.
Walter Aired Co., Contr's, Swainsboro, Ga.

The Case of the **BUILDING FIRE COULDN'T DESTROY**

Beginning with only four brick walls that withstood a disastrous fire, the architects economically created an impressive structure of great beauty using a veneer of sand rubbed Georgia Marble. This is but one of many applications that prove Georgia Marble—*"The Marble with the Sparkling Crystal"*—an ideal building stone.



Data accumulated over 63 years is available to you. Write our nearest sales and service office giving the type of building under consideration. We will send you a specially prepared file containing detail sheets and other information of interest and value.

GEORGIA MARBLE

The Marble with the Sparkling Crystal

Produced by THE GEORGIA MARBLE COMPANY *of Tate, Georgia*

Sales and Service Offices • NEW YORK, N. Y. • WASHINGTON, D. C. • CLEVELAND, O. PHILADELPHIA, PA. • BRIGHTON, MASS. • ROCHESTER, N. Y. • ATLANTA, GA.

THE RECORD REPORTS

(*Continued from page 18*)

tion and expansion of housing and community facilities.

3. HHFA has been working on a plan to make available to federal agencies and private appraisers a simplified and uniform set of construction cost data.

4. The Commerce Department estimates that construction demand for lumber in 1948 will reach 26.5 billion board feet, 2 billion more than last year; that steel requirements will jump to 6.9 million tons, 400,000 above 1947; that gypsum board and lath supplies may run slightly over consumption; that cast iron soil pipe needs will run 10,000 tons more than 1947 supply and that wire nails may be in even shorter supply than last year unless output mounts.

❖ ❖ ❖

ON THE CALENDAR

Jan. 12–March 20: "2500° F. — The Art and Technique of Modern Glass," exhibition of modern glass from 51 American and European manufacturers, The Cooper Union Museum for the Arts of Decoration, New York City.

Jan. 21–April 18: "Stage Designs for the Ballet Society, 1947–1948," an exhibition of drawings and models, The Museum of Modern Art, New York City.

Jan. 23–May 2: "The Kings College — A History of Columbia University," exhibition of Columbia memorabilia in honor of General Eisenhower's forthcoming inauguration as President of the University, Museum of the City of New York.

March 2, 4, 8, 10, 11: Series of public lectures, "Cities in Transition — The Causes and Consequences of Metropolitan Decentralization," Frick Chemical Laboratory, Princeton University, Princeton, N. J.

March 6: Symposium on Educational Buildings, sponsored by the Pennsylvania Society of Architects, Houston Hall, University of Pennsylvania, Philadelphia, Pa.

March 6–20: "Eckbo, Royston and Williams," exhibition of landscape architecture, School of Architecture and Allied Arts, University of Oregon, Eugene, Ore.

March 7–April 16: Architectural Exhibition, "The Contemporary House and Its Neighborhood," sponsored by New Jersey Society of Architects, New Jersey Chapter, A.I.A., and New York Chapter, A.I.A., New Jersey State Museum, Trenton, N. J.

March 15–19: 6th Annual A.S.T.E. Industrial Exposition and 16th Annual Meeting, American Society of Tool

(*Continued on page 156*)

ONE PRODUCT

Floors are placed *faster* with Pittsburgh Steeltex Floor Lath. Additional reinforcement is not required because Steeltex Floor Lath is a *combination* of form and reinforcement for both concrete and gypsum floors and roofs.

With Steeltex you get high-tensile reinforcement, uniformly spaced and laced to a waterproof cord reinforced backing. It definitely aids curing of concrete because the water cannot run through and must evaporate slowly. This provides maximum strength and reduces cracking in the slab. Also Steeltex minimizes drip and prevents waste of cement and aggregate and the resultant clean-up expense on joists and floors below. Note that the lacing wires in Steeltex are crimped and permit separation of the backing from the reinforcing fabric which gives you automatic imbedment from the weight of the mix.

You'll like the way your jobs move along—swiftly, smoothly and at a big saving in time and material. You'll like the end result: better finished floors and roofs with Pittsburgh Steeltex Floor Lath. Specify Steeltex on your next job. For your copy of our catalog D. S. 133 write today to Pittsburgh Steel Products Co., 3233 Grant Bldg., Pittsburgh 30, Pennsylvania.

The background photo shows Steeltex—one-third actual size.

Pittsburgh Steel Products Company

Subsidiary of Pittsburgh Steel Company

Showroom of the National Cash Register Company, Rockefeller Center, New York City. L-I-N-O-L-I-T-E Series 11, two 40 watt lamps, louver shielded fixtures (11-248L) were used to obtain 35 foot-candles maintained.

Take advantage of a FRINK *PLAN-O-LITE*

...CUSTOM-DESIGNED TO GUARANTEE LIGHTING SATISFACTION

The list of firms that have used Frink's ***PLAN-O-LITE*** service reads like a blue book of American business. This convenient service is the sound guaranteed approach to securing custom-engineered lighting efficiency at reasonable *standard-fixture* cost.

Each Frink ***PLAN-O-LITE*** is an individual fluorescent lighting layout . . . supplied at no extra cost . . . designed to meet your exact illumination requirements . . . and *guaranteed* for complete satisfaction, if Frink specifications are followed.

Our sample packet of ***PLAN-O-LITE*** layouts and photos of resulting installations will prove interesting to anyone concerned with illumination problems. Send the coupon for yours today.

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Without cost or obligation, send your sample packet of PLAN-O-LITE fluorescent layouts and photos to the

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( ) also please send catalogue of new Frink fluorescent fixtures. 3-AR

There's a Frink L-I-N-O-L-I-T-E fixture correctly engineered for every commercial fluorescent lighting need. Seventeen standard designs of highest quality workmanship and materials, each available with matching incandescent down-lights if desired. Check coupon at left for your copy of the Frink catalogue today.

PLANNED LIGHTING
FRINK
SINCE 1857

THE FRINK CORPORATION
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DURING the past half century, association members have produced more than four billion feet of Northern Hard Maple Flooring in strips and blocks. And many floors of this tough-fibred, tight-grained wood laid thirty to fifty years ago are still giving satisfactory service. Northern Hard Maple wears evenly and is highly resistant to slivering and splintering. It remains resilient, smooth and beautiful through the years—easy to clean and maintain. That's why this remarkable wood is the economical flooring for schools, gymnasiums, factories, textile mills, bakeries, flour mills, stores, roller rinks, bowling alleys, ballrooms, homes and churches.

Early in its life the association perfected better methods of milling, kiln drying, matching and finishing Hard Maple. It prepares and publishes Grading Rules which are in general use. It issues recommended specifications for the construction of Northern Hard Maple Floors. As a result, the MFMA trademark is the symbol of excellence on which builders rely: a guarantee as to grade, millwork, kiln drying and matching.

Association activities will be continued so that additional valuable contributions may mark its next fifty years. Research on new applications of Northern Hard Maple Flooring in the buildings of tomorrow is under way.

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BEECH AND BIRCH

NEW RADIANT PANEL SYSTEM LOWERS CONSTRUCTION AND HEATING COSTS FOR SINGLE FLOOR-PLAN HOUSES

One of 80 three-bedroom houses of the Kew Garden project designed by Mellenbrook, Foley & Scott and built at Berea, Ohio, suburb of Cleveland, by Taft and Blackman.

Typical floor plan; note location of the compact Janitrol Winter Air Conditioner in the combination kitchen-utility room.

● There's no guesswork about the results of these 80 warm air radiant heating installations, for many of these homes have been occupied for more than a year.

The system which employs a Janitrol Winter Air Conditioner, works beautifully and the home owners are immensely enthusiastic.

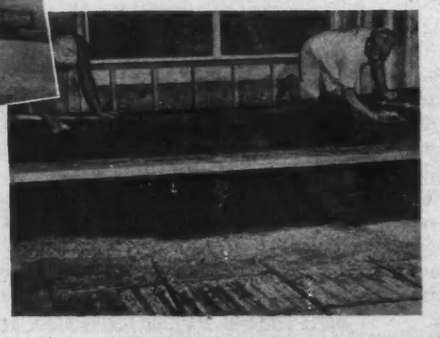
All of the floor area, except the garage, of these one floor type houses is radiant panel heated. The Janitrol gas-fired 105,000 Btu Winter Air Conditioner is located in the combination kitchen-utility room. See floor plan at the left.

In addition to the solid comfort supplied by quiet, automatic Janitrol heat, installation of the unit and house construction costs were materially lowered by the unique heat distribution system.

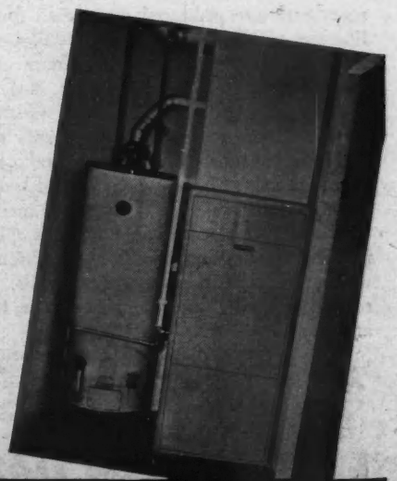
Forced warm air is first conducted upward to the attic and then distributed by stacks located in the walls to the under-floor duct system. Special care was given in the duct design to minimize any resistance to air flow.

A more complete description of the construction and operating details of this money-saving, modern heating system is available upon request. Write for the "Kew Gardens Story" and learn how Janitrol can help you sell better home comfort at lower cost

Beginning of floor construction, two tiers of bricks are laid on concrete slab to form heat distribution ducts 5½" deep.



Pouring concrete over corrugated sheet steel above the duct tiers on which reinforcing bars are supported.



Extremely compact, this 105,000 Btu Janitrol Winter Air Conditioner requires a floor space of less than 22" x 22".

Janitrol

SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO

This startling transformation ... of old building space into a modern executive office at the Okonite Company, Passaic, New Jersey, is characteristic of the new decorative effects which are easily achieved with M/P Metlwal Paneling and Partitioning.

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Distinctive, Permanent Paneling?

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Movable Partitions for Flexible Floor Plans

In outer offices, where efficient use of space may require floor plan changes, Metlwal movable partitions provide a durable, attractive means of dividing space . . . permanent, yet easily moved without waste of time or material.

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Write today for FREE BOOKLET A-3 for your A.I.A. file . . . showing how Metlwals can help you plan and utilize office space more effectively . . . how Metlwals are made and installed . . . along with specifications and photos of actual installations. ADDRESS: Martin-Parry Corporation, Toledo 1, Ohio. PLANTS: Toledo, Ohio; York, Pennsylvania.

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Louisville — E. C. Decker & Co.

LOUISIANA
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MAINE
Portland — Pitcher & Co.

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Boston — Pitcher & Co.
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Grand Rapids — Leggette-Michaels Co.

MINNESOTA
Minneapolis — Insulation Sales Co., Inc.

MISSOURI
Kansas City, St. Louis — Hoeges Co., Inc.

NEW JERSEY
Elizabeth, Trenton — Jacobsen & Co.
The W. M. Meyer Co.

NEW MEXICO
Albuquerque — The Jay Grear Corp.

NEW YORK
Albany, Buffalo, Jamestown, Rochester, Syracuse — Celium Acoustical Co.
New York City — Jacobsen & Co.

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Charlotte — Acousti Engineering Co. of the Carolinas

OHIO
Akron, Cleveland, Columbus, Toledo — Mid-West Acoustical & Supply Co.
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Harrisburg, Philadelphia, Scranton — The W. M. Meyer Co.

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Providence — Pitcher & Co.

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Milwaukee, Green Bay — Edw. T. VerHalen, Inc.

WYOMING
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CONSTRUCTION COST INDEXES — Labor and Materials

United States average 1926—1929 = 100

Presented by Clyde Shute, manager, Statistical and Research Division, F. W. Dodge Corporation, from data compiled by E. H. Boeckh & Associates, Inc.

	NEW YORK					ATLANTA				
	Residential		Apts., Hotels, Office Bldgs.	Commercial and Factory Buildings		Residential		Apts., Hotels, Office Bldgs.	Commercial and Factory Buildings	
Period	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1920	136.1	136.9	123.3	123.6	122.6	122.8	122.9	108.6	109.8	105.7
1925	121.5	122.8	111.4	113.3	110.3	86.4	85.0	88.6	92.5	83.4
1930	127.0	126.7	124.1	128.0	123.6	82.1	80.9	84.5	86.1	83.6
1935	93.8	91.3	104.7	108.5	105.5	72.3	67.9	84.0	87.1	85.1
1939	123.5	122.4	130.7	133.4	130.1	86.3	83.1	95.1	97.4	94.7
1940	126.3	125.1	132.2	135.1	131.4	91.0	89.0	96.9	98.5	97.5
1941	134.5	135.1	135.1	137.2	134.5	97.5	96.1	99.9	101.4	100.8
1942	139.1	140.7	137.9	139.3	137.1	102.8	102.5	104.4	104.9	105.1
1943	142.5	144.5	140.2	141.7	139.0	109.2	109.8	108.5	108.1	108.7
1944	153.1	154.3	149.6	152.6	149.6	123.2	124.5	117.3	117.2	118.2
1945	160.5	161.7	156.3	158.0	155.4	132.1	133.9	123.2	122.8	123.3
1946	181.8	182.4	177.2	179.0	174.8	148.1	149.2	136.8	136.4	135.1
Sept. 1947	225.9	227.5	216.4	216.0	210.4	185.6	189.5	164.1	162.3	165.0
Oct. 1947	228.7	231.0	218.5	217.4	213.8	186.9	191.0	165.0	163.0	165.8
Nov. 1947	229.1	231.4	219.0	217.8	214.2	187.3	191.4	165.5	163.4	166.2
Dec. 1947	231.3	234.1	219.8	218.4	215.1	189.3	194.0	166.7	164.5	169.4
	% increase over 1939					% increase over 1939				
Dec. 1947	87.0	91.0	68.1	64.0	65.1	119.0	131.8	75.1	69.0	78.5

	ST. LOUIS					SAN FRANCISCO				
1920	118.1	121.1	112.1	110.7	113.1	108.8	107.5	115.2	115.1	122.1
1925	118.6	118.4	116.3	118.1	114.4	91.0	86.5	99.5	102.1	98.0
1930	108.9	108.3	112.4	115.3	111.3	90.8	86.8	100.4	104.9	100.4
1935	95.1	90.1	104.1	108.3	105.4	89.5	84.5	96.4	103.7	99.7
1939	110.2	107.0	118.7	119.8	119.0	105.6	99.3	117.4	121.9	116.5
1940	112.6	110.1	119.3	120.3	119.4	106.4	101.2	116.3	120.1	115.5
1941	118.8	118.0	121.2	121.7	122.2	116.3	112.9	120.5	123.4	124.3
1942	124.5	123.3	126.9	128.6	126.9	123.6	120.1	127.5	129.3	130.8
1943	128.2	126.4	131.2	133.3	130.3	131.3	127.7	133.2	136.6	136.3
1944	138.4	138.4	135.7	136.7	136.6	139.4	137.1	139.4	142.0	142.4
1945	152.8	152.3	146.2	148.5	145.6	146.2	144.3	144.5	146.8	147.9
1946	167.1	167.4	159.1	161.1	158.1	159.7	157.5	157.9	159.3	160.0
Sept. 1947	207.5	209.0	191.2	190.8	192.3	198.4	196.3	192.5	197.4	195.7
Oct. 1947	210.7	213.0	192.2	191.5	193.4	207.1	206.2	195.4	199.6	198.9
Nov. 1947	212.1	214.0	193.6	192.5	194.5	207.7	206.8	196.2	200.2	199.5
Dec. 1947	217.5	220.9	194.9	193.4	196.3	209.7	209.3	196.8	200.6	200.2
	% increase over 1939					% increase over 1939				
Dec. 1947	97.4	107.2	64.0	61.3	65.1	98.2	110.5	67.2	65.1	72.0

The index numbers shown are for combined material and labor costs. The indexes for each separate type of construction relate to the United States average for 1926–29 for that particular type — considered 100.

Cost comparisons, as percentage differences for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A = 110
index for city B = 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

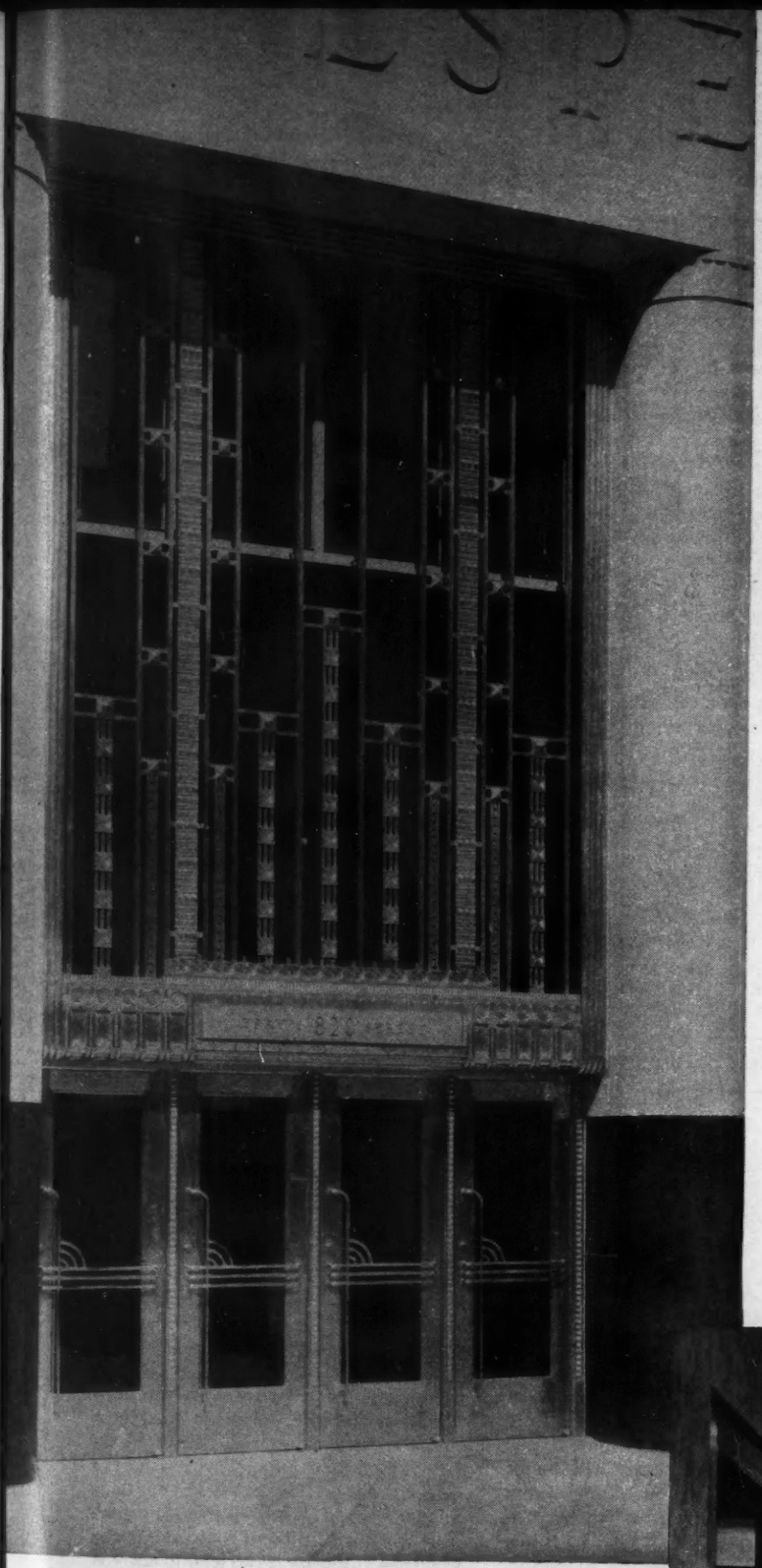
Conversely: costs in B are approximately 14 per cent lower than in A.

$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926–29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.

These index numbers will appear whenever changes are significant.



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YOU WILL FIND Anaconda Nickel Silver true to the up-to-the-minute spirit of the West—as this time-honored metal graces the entrances and hallways of Houston, Texas' smart Mellie Esperson Building.

Gleaming, luxurious nickel silver lends a pleasant note of warmth—adds a brightness to this building that will last through the years. This ageless metal is famous for giving a youthful "new look" for decades to the buildings it adorns.

For ornamental work of every description, choose Anaconda Architectural Bronze and Nickel Silver—long the choice of architects and fabricators alike for their high resistance to corrosion, and economical qualities. In addition to a wide range of extruded shapes, The American Brass Company furnishes drawn shapes, angles, channels, sheet, strip and tube in metals to match the colors of architectural bronze and nickel silver extrusions.

The 24-floor Mellie Esperson Building, Houston, Texas —John and Drew Eberson, New York City, Architects— was completed in 1941. Anaconda Nickel Silver is used extensively in doors, doorways, hand rails, and ornamental work. General Bronze Corporation, Garden City, L. I., N. Y., fabricated the main entrance way (see left) as well as all other nickel silver metal work.

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REQUIRED READING

A STYLE IS BORN

American Building: The Forces That Shape It. By James Marston Fitch. Boston, Mass. (2 Park St.), Houghton Mifflin Co., 1948. 6 by 9 in. xvi + 382 pp. illus. $5.00.

Fifteen years ago an analysis of American building such as this by James Marston Fitch would have had little appeal for the public at large; today, however, it may well attract considerable attention. The reason, of course, is that outcropping of interest in things technical and semi-technical which seems to be characteristic of every post-bellum era. The public is eager to be told what it should demand of the future — and Utopia once more looms large on the horizon. With this book Mr. Fitch has joined the educators: "The average man," he says, "is wretchedly informed as to what performance he has a right to demand of buildings; and it has been the central purpose of this book to explain what he should demand and why."

In point of fact, AMERICAN BUILDING is a highly interesting volume. Mr. Fitch has a flair for story-telling which he has used to good advantage in the first half of the book dealing with the history of American building from Puritan times to the present. He also has a wide technical knowledge and the ability to uncomplicate things for the lay reader — valuable assets to him in the second half of the volume, concerned with the techniques of modern building.

Into his first eight chapters, as carefully designed as the "efficiency apartment" he describes further on, Mr. Fitch has packed a filbert-shell summary of 300 years. Though centering his account on building and architecture, he includes enough straight history to tie his subject to the times. Policies and politics, whaling fleets and weather, *mores* and ingenuity, men and materials, all had an effect on the evolving American architecture, hence all have a place in Mr. Fitch's account. Among the men are Jefferson, Latrobe, Roebling, Sullivan and Frank Lloyd Wright — good figures all for interesting reading.

As for the technical half of the volume, it is as detailed and thorough as anyone could wish. In a quarter-century of close connection with the building field Mr. Fitch has amassed a wealth of technical information which has enabled him to discuss intelligently every facet of building. His concept of the building of the future, however, is somewhat more Utopian than practical: technology may make possible the comforts and conveniences he foresees, but technology does not necessarily make them probable. On the other hand, he who asks for the moon may finally get a star, and it certainly will do no harm to educate the lay public as to what technology can offer.

Mr. Fitch is frank to admit that laymen ask more of buildings than mere good performance — "some quality which they have found in the traditional design and miss in the modern one." This quality he thinks is *sentiment*. Modern architecture, he says, was obliged to reject the use of art forms for the explicit statement of sentiment, and to forbid the continuing dictation by sentiment of the "actual configuration of a building or the shape, size, and articulation of its various elements. The pitch of its roof, the size of its windows, the presence or absence of columns — these must be determined by objective criteria. But it is precisely these elements of traditional form and proportion which have always hitherto carried the principal burden of sentiment in architecture." Somehow or other a compromise must be reached — and will be, Mr. Fitch is sure. The issue, he says, "is not simply one of whose standards are best — the layman's or the specialist's. It may be true, as is often charged, that the average American has a low level of taste; but it may also be true that the standards which the architect and artist are offering him are incorrect in the light of social reality. . . ."

TECHNICAL BULLETINS

TRIO ON BUILDING

Foundations and Basements; Heating and Air Conditioning; Insulation, Weatherstripping, Storm Sash. Booklets 1, 2 and 3 in a series prepared by Good Housekeeping Building Forum: Joseph B. Mason, Director, Jule R. von Sternberg, Architect, and Ronald Allwork, A.I.A., Technical Editor. New York 19 (57th St. at 8th Ave.), Good Housekeeping Magazine, 1947. 8½ by 11¼ in. 28, 30 and 20 pp. respectively. illus. 25 cents each.

These three booklets, the first in a series being published by the Good Housekeeping Building Forum, were prepared primarily for consumers, but have much in them that will be of interest to the architect. Each of the three presents a typical list of consumers' questions on its special topic, and answers the questions in simple terms with the main points emphasized by drawings or photographs.

The first of the three, "Foundations and Basements," describes the three basic types of foundation, the materials that commonly go into them, and the factors to be considered in selecting among them.

The second booklet, "Heating and Air Conditioning," explains and illustrates different types of heater and discusses the advantages and disadvantages of each. It then describes in detail — though in simple terms — the several heating systems: warm-air (both gravity and forced), radiator (hot water and steam), and radiant. In each case it diagrams the system and illustrates the equipment used. Two final sections take up the choice of fuel and the principles of summer cooling.

The "weather-protection" booklet follows the pattern set in the first two, stating the goal to be achieved and explaining various methods of attaining it. Four types of insulation are discussed: fill, flexible, rigid and reflective. A full diagram of a two-story-and-dormer residence points out where weather-protection should be installed, and several pages are devoted to weather-stripping, storm sash and condensation.

NEW EDITIONS

RECURRENT LE CORBUSIER

Concerning Town Planning. By Le Corbusier. Translated from the French by Clive Entwistle. London, S.W. 1 (13 Queen Anne's Gate), The Architectural Press, 1947. 5½ by 8 in. 127 pp. illus. 10s. 6d.

The City of Tomorrow. By Le Corbusier. Translated from the 8th French Edition of Urbanisme *by Frederick Etchells. London, S.W. 1 (13 Queen Anne's Gate), The Architectural Press, 1947. 5½ by 8½ in. 110 pp. illus. 15s.*

If all the books by Le Corbusier that have come off the presses during the past year were laid end to end, their author certainly would demand that they be stacked to liberate valuable ground area.

The latest contributions are new editions of two books on town planning, one originally written in 1924 and the other in 1946. Their publication by The Architectural Press in London is another indication of the careful study the British are giving to their reconstruction plans.

THE CITY OF TOMORROW was first published in France under the title, URBANISME, and the present edition is a reproduction of the first English translation, published in 1929, with the original illustrations chosen (but unfortunately not all drawn) by the author. This work is of present interest for the weight of authority it can lend to current town planning. As Le Corbusier states in his preface, "This reprint will provide the historical background where some people imagine there is only improvisation." Planners who have seen one after another of their schemes laid to rest in municipal files may take heart from this book of 1924, for many of the ideas set forth in it — the express highways, the grouped skyscrapers, the office building

(*Continued on page 30*)

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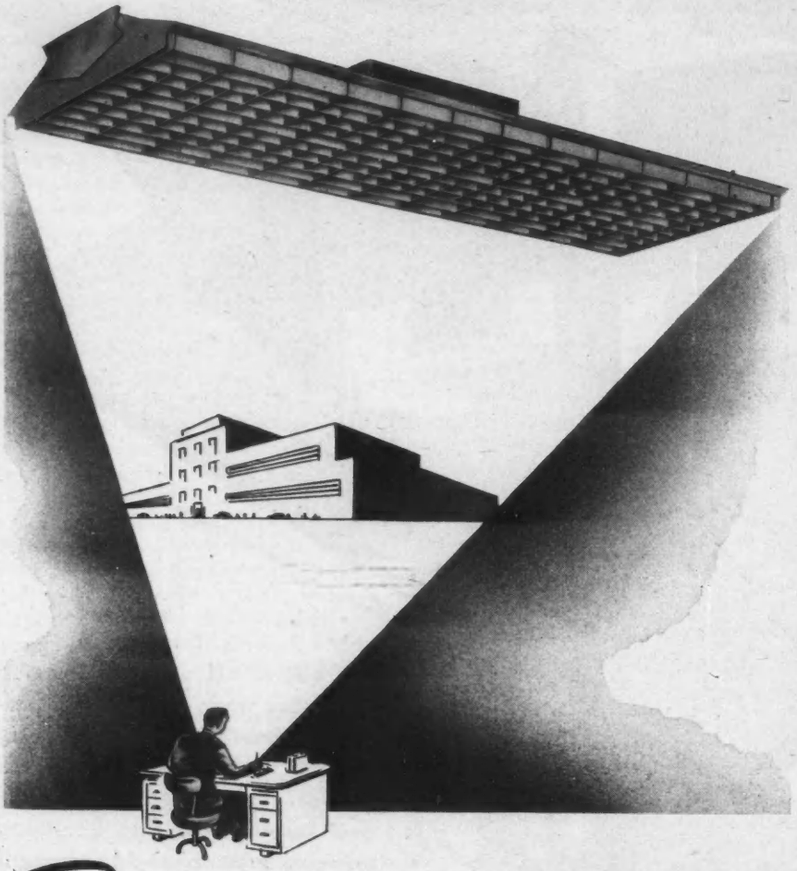

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LIGHTING DIVISION
CHELSEA 50, MASSACHUSETTS

REQUIRED READING

(*Continued from page 28*)

subway stations — actually have materialized. Le Corbusier has no cause, like the pyromaniac architect of the Alan Dunn sketch, "to destroy all his early work."

After a 16-page conducted tour of ancient cities, CONCERNING TOWN PLANNING takes the form of answers to a questionnaire posed by an abortive postwar British periodical. Le Corbusier seeks "to show the anxiety of a fearful clientele to which is opposed the calm reasoning of the technician." In response to querulous questionings about "harmony of the new with the old," "blocks of flats or single family houses," "the role of private enterprise," "exclusively utilitarian architecture," etc., he interprets for contemporary needs his philosophy of vertical garden cities, agricultural units, linear industrial towns and cities of exchanges. He even states that regionalism must become universalism, that "measures must be taken with the geography of Europe . . . to join and unite, and not to multiply the gun-muzzles along frontiers that are ready for dissolution before the sap which is thrusting from the future."

LIGHTING

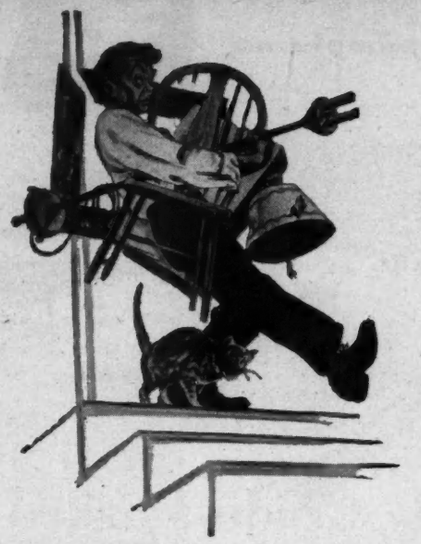
Fluorescent Lighting Manual. By Charles L. Amick. New York 18 (330 W. 42nd St.), McGraw-Hill Book Co., Inc., 1947. 6 by 9 in. 317 pp., index. illus. 2nd ed., revised. $4.00.

The 1942 manual has been revised by the author, and material has been added on new types and sizes of fluorescent lamps, auxiliary equipment improvements, and recent lighting techniques. Practical installation design is emphasized, with a full explanation of the glare rating system, and a large section of photographs of actual installations in factories, stores, homes and offices.

CONSTRUCTION ESTIMATES

Construction Estimates and Costs. By H. E. Pulver. New York 18 (330 W. 42nd St.), McGraw-Hill Book Co., Inc., 1947. 6 by 9 in. 653 pp., index. illus. 2nd edition, revised. $6.00.

More than half the diagrams have been redrawn and most of the illustrative estimates have been revised in order to bring the 1939 text of this manual up to date for the second edition, but users may have to make their own revisions to keep up with still rising costs. Step-by-step instructions are given for estimating each element of construction work, and the tables and diagrams are comprehensive in content but simple in form. The book is indexed carefully for quick and easy reference.



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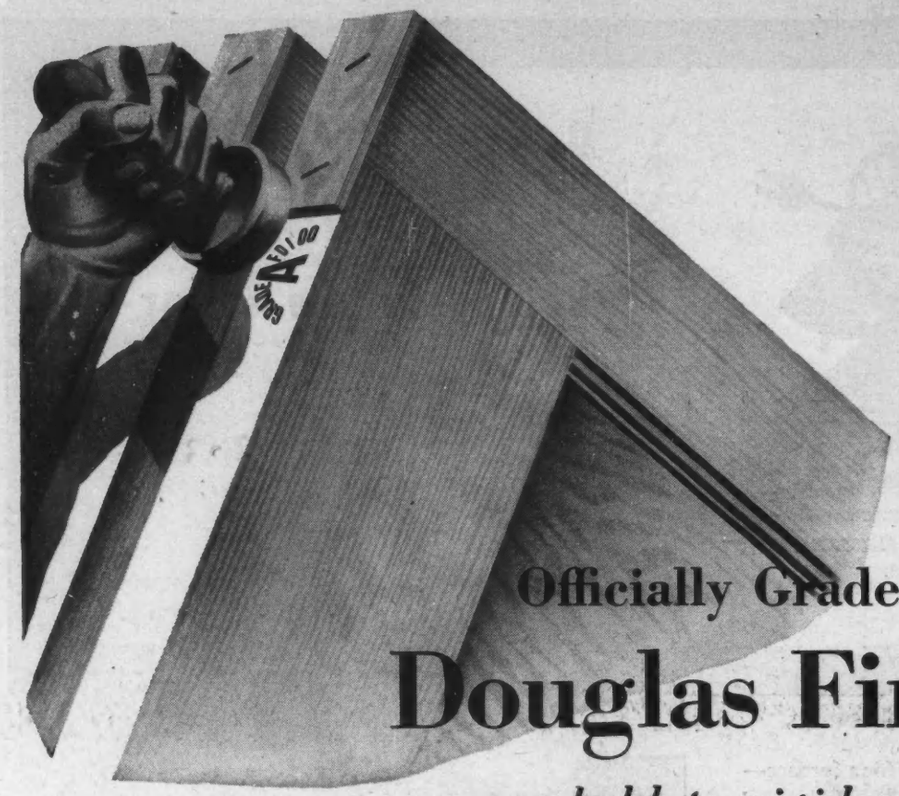

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NOW in effect are new quality standards for all Douglas fir doors, and new dimension specifications for stock interior doors—both backed by official Fir Door Institute inspection.

Stock interior doors are pre-fit to 1/8-inch less than previous catalog height and 3/16-inch less than catalog width, which permits on-the-job installation without sawing or trimming. Stock doors are also resin pre-sealed for better finishing and improved dimensional stability.

On order, Douglas fir interior doors are available Factri-fit as well—pre-fit, pre-sealed and completely machined for locks and hinges.

All these features come under official inspection—as does workmanship and grade. The F.D.I. "grade trade-mark" is your assurance of a high-quality, uniform product.

GRADE A F.D.I.100 GRADE B F.D.I.100 GRADE C F.D.I.100 GRADE MR F.D.I.100

One of these distinctive F.D.I. "grade trade-marks" appears on the bottom of every officially inspected Douglas fir door—and only on doors as inspected. Look for the F.D.I. seal. It is your symbol of fine craftsmanship, backed by rigid inspection.

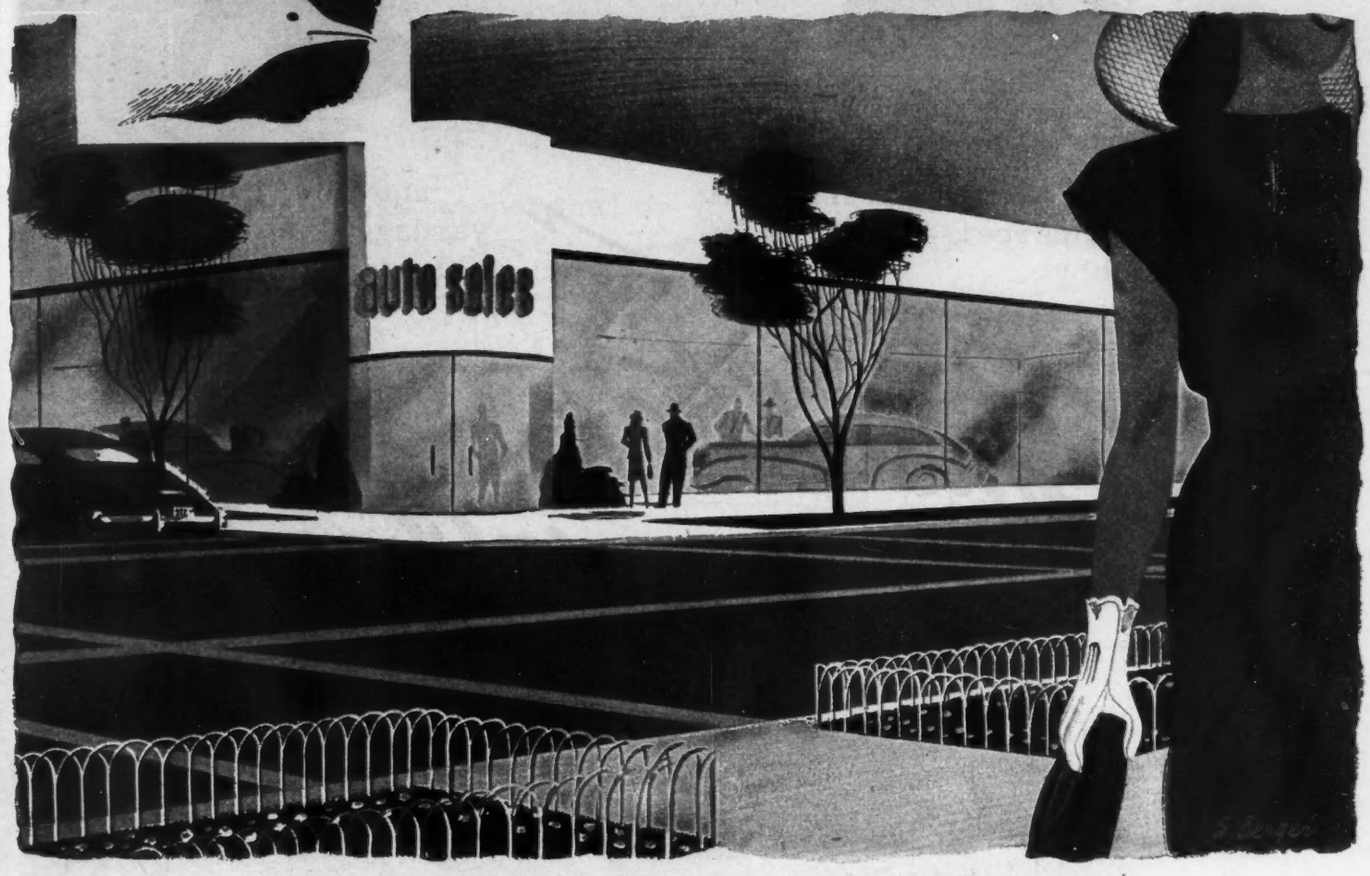
FIR DOOR INSTITUTE

TACOMA BUILDING — TACOMA 2, WASHINGTON

THE NATIONAL ASSOCIATION OF DOUGLAS FIR DOOR MANUFACTURERS

Extra White . . .

an element of the sea gull's beauty and charm



Extra Whiteness . . .

gives beauty and charm to many a structure

An architectural designer may harness the whiteness of Trinity to a number of useful purposes—and in a number of different ways.

Use its superlative whiteness with compelling effect in masses. Or in contrasting trim to embellish a design. Properly used in exterior and interiors, its light reflecting properties can be most helpful.

Use Trinity White in . . . architectural concrete units; cast stone; terrazzo; stucco; cement paints; many concrete floors; and roof tile.

Trinity White—the whitest white cement—is a portland cement. Hence it combines permanence, workability and strength with great beauty. Trinity Portland Cement Division, General Portland Cement Co., 111 West Monroe Street, Chicago; Republic Bank Building, Dallas; 816 W. 5th Street, Los Angeles.

As white

as snow

TRINITY WHITE PORTLAND CEMENT

PLAIN OR WATERPROOFED

...Want to Keep Theatre Carpet Cos

When you are wondering what kind of carpet to put in the lobby...

...and how you can save on yardage...and how much it all will cost...

Consult a Contract Carpet Specialist!

Are you planning a theatre job? Take a tip from us and consult a carpet specialist – an Alexander Smith carpet contractor or sales representative. He is a theatre decorating specialist...a color and texture expert...a traffic technician all rolled into one. He will save you headaches and your client money.

Give him a chance to:

1. Cut your costs by estimating accurately — keeping yardage down.
2. Save on upkeep by advising the most economical grade and weave for each specific location.
3. Increase your satisfaction by suggesting the design and color which will harmonize best with your interior.

He is ready to show samples and estimate. He will see that you get an expert laying job.

The Alexander Smith and Masland lines handled by Alexander Smith contractors and sales representatives include types, grades, and colors of carpet suitable for every theatre installation.

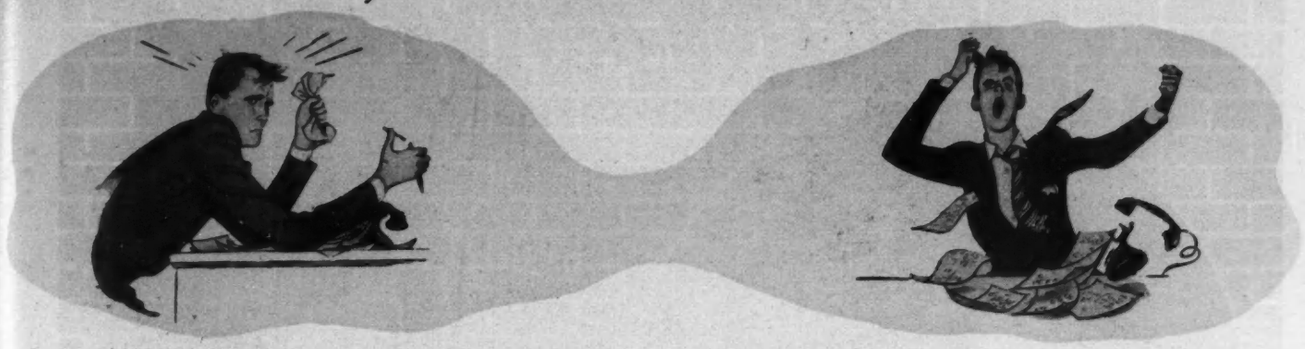
ALEXANDER SMITH ☆ MASLAND

Contract Carpets

. .and
grade

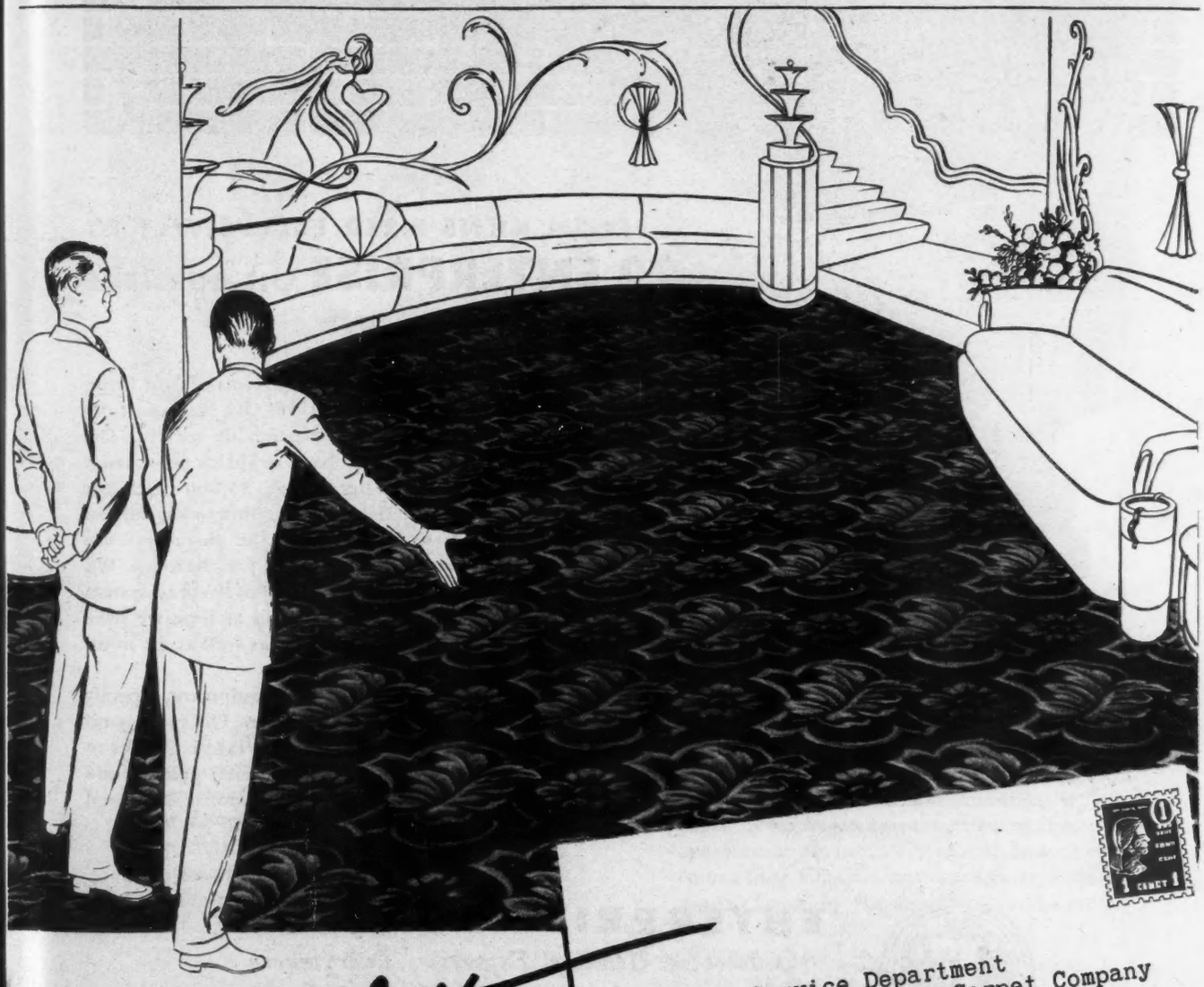
ALEXANDER SMITH
Rug Weavers since 1845

pet Costs Down, Mr. Architect?



. .and what is the most economical grade for that particular spot...

...and what color and pattern to get...relax!

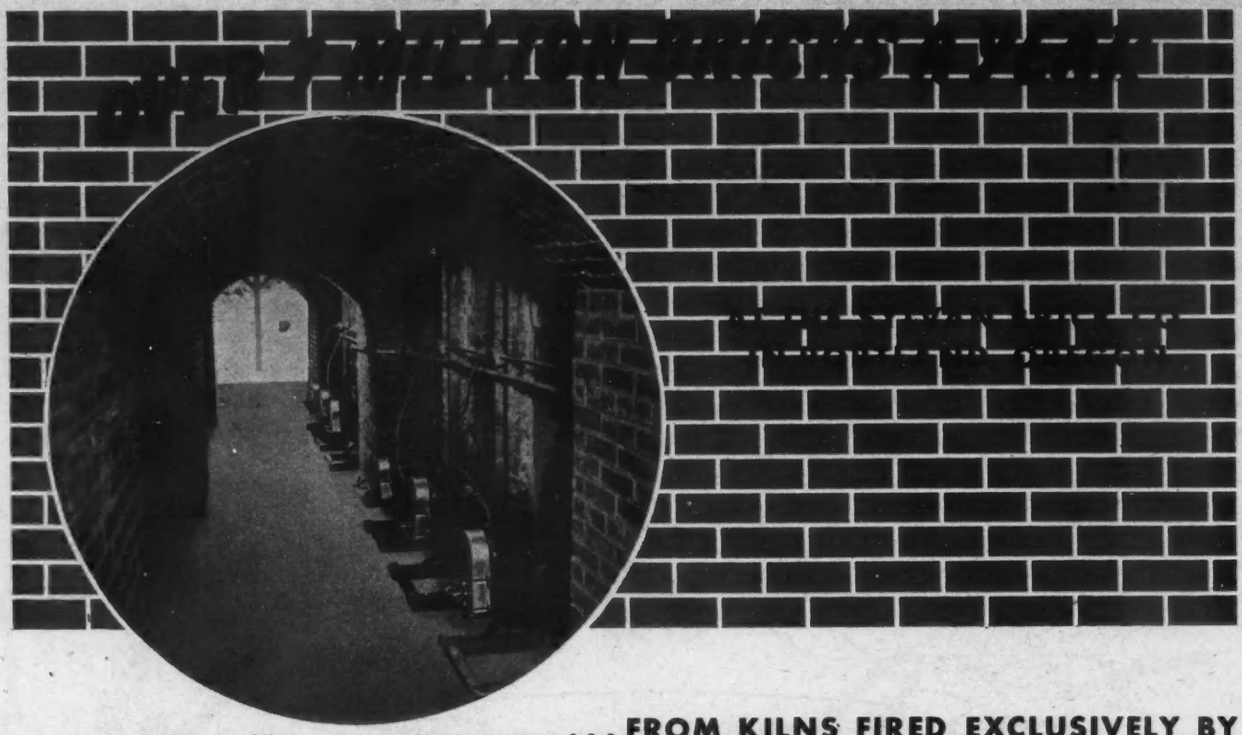


Write

Contract Service Department
Alexander Smith & Sons Carpet Company
295 Fifth Avenue, New York 16, N. Y.

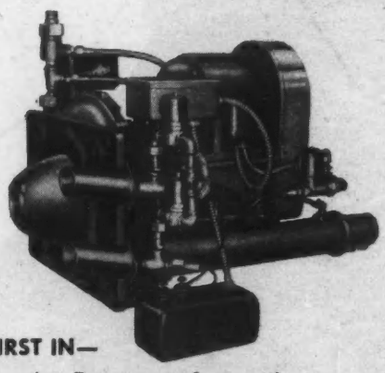
ALEXANDER SMITH
Carpet Weavers since 1845
ALL-WOOL RUGS

ALWAYS BETTER THAN NEED BE
MASLAND



Above view shows six of the twenty-two ENTERPRISE Burners in service on the kilns at Sylvan Brick Co. installed by Enterprise Oil Burner Distributor E. A. Ponder Co., Portland, Oregon. Flexibility of operation is one of the important features that has led to the choice of ENTERPRISE Burners—exclusively.

. . . FROM KILNS FIRED EXCLUSIVELY BY 22 ENTERPRISE OIL BURNERS



FIRST IN—

- ★ Economy of operation
- ★ Flexibility, adaptability
- ★ Low maintenance
- ★ Efficient, safe combustion
- ★ Simplicity, compactness

Wherever a process makes exacting demands on firing equipment, you will find ENTERPRISE Oil Burners fully qualified for constant, efficient and dependable service. The Sylvan Brick Company, for example, has a red brick production capacity that averages 19 kilns per month, 33,000 brick per kiln. Mr. C. E. Jensen, Plant Manager, has this to say for his twelve years' experience with ENTERPRISE Burners: "We are now using twenty-two ENTERPRISE Oil Burners. We operate them continuously . . . no other type of burning system is needed on our kilns. During this period of time we have been well satisfied with their performance, as well as the minimum upkeep requirements."

For the best in heavy-duty firing equipment, specify ENTERPRISE industrial or automatic burners. Oil and gas-oil combination burners are available in a wide range of sizes to meet requirements for all types of commercial, general and special industrial heating and power applications. Approved by Underwriters Laboratories, Inc.

ENTERPRISE BURNERS

. . . Choice of Heating Experts . . . Everywhere

BURNER DIVISION OF ENTERPRISE ENGINE & FOUNDRY CO.

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OIL BURNERS • DIESEL ENGINES • PROCESS MACHINERY

100TH YEAR OF OVEN MAKING

From the first cabinet oven hand-made by our company until today's efficient, streamlined, sectional gas-fired units, we have devoted 100 years exclusively to oven manufacture • Years replete with progressive design and technique development, to which Blodgett employees, purveyors and users have made notable contributions . . . contributions which have helped our engineers to bring excellence in design, in construction, in performance, in utility and in low cost to more than 60,000 contemporary installations. Look to Blodgett for leadership!

ONE HUNDRED YEARS OF

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OVENS

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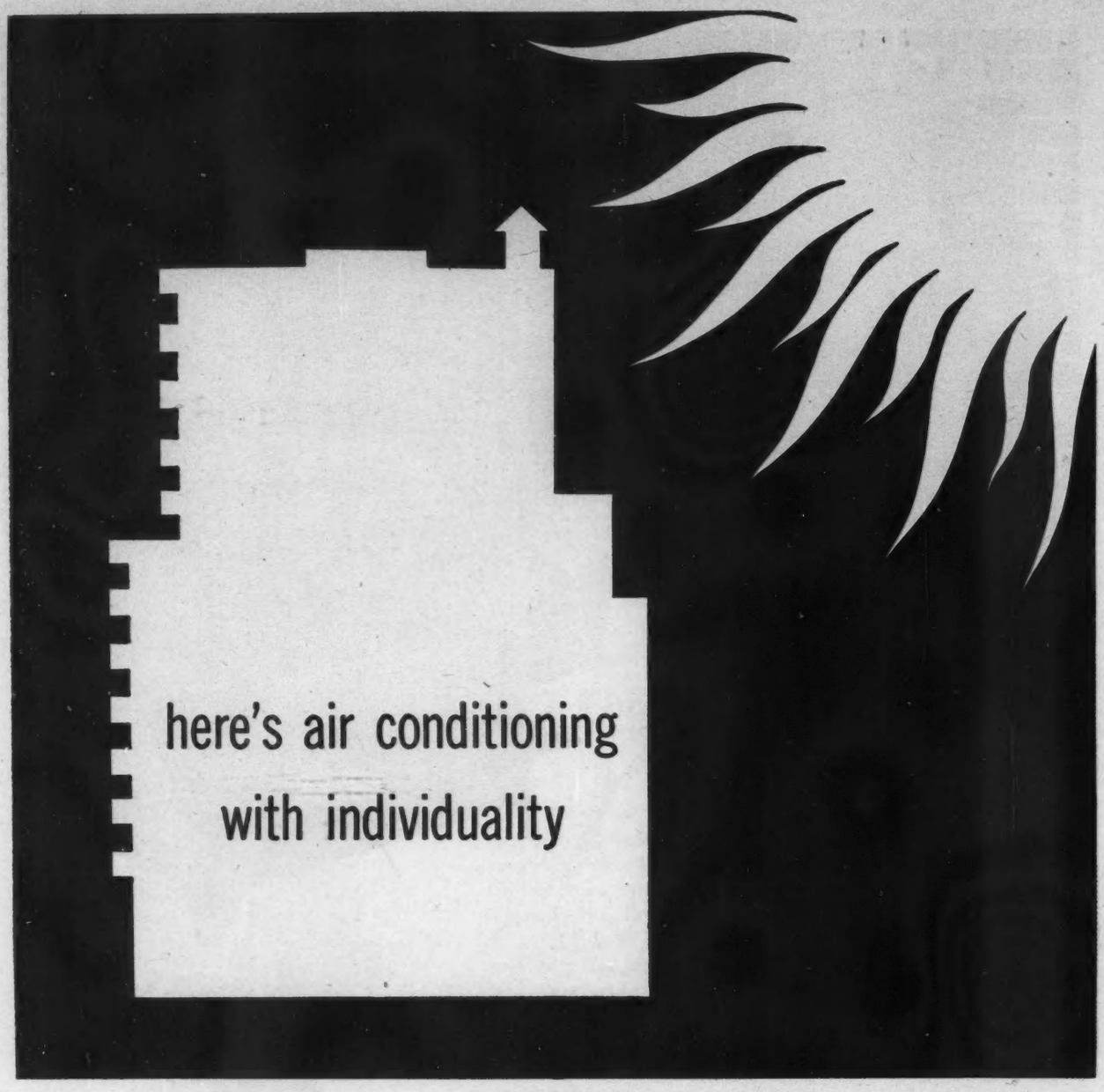


Now it's possible to plan ideal indoor weather for every room in any multi-story building regardless of its location, variable occupancy, or alternate exposure to sun and shade. It may be exposed longer to the sun than others . . . may get the full blast of icy winter winds. Yet the Carrier Conduit Weathermaster System permits complete control of temperature and humidity in individual rooms at any season of the year. A turn of the individual knob gives the occupants *exactly* the kind of weather they want.

This revolutionary year-round system supplies outside air continuously. Use of small-diameter conduit instead of bulky supply and return ducts saves *rentable* floor space . . . and often a story height in new buildings.

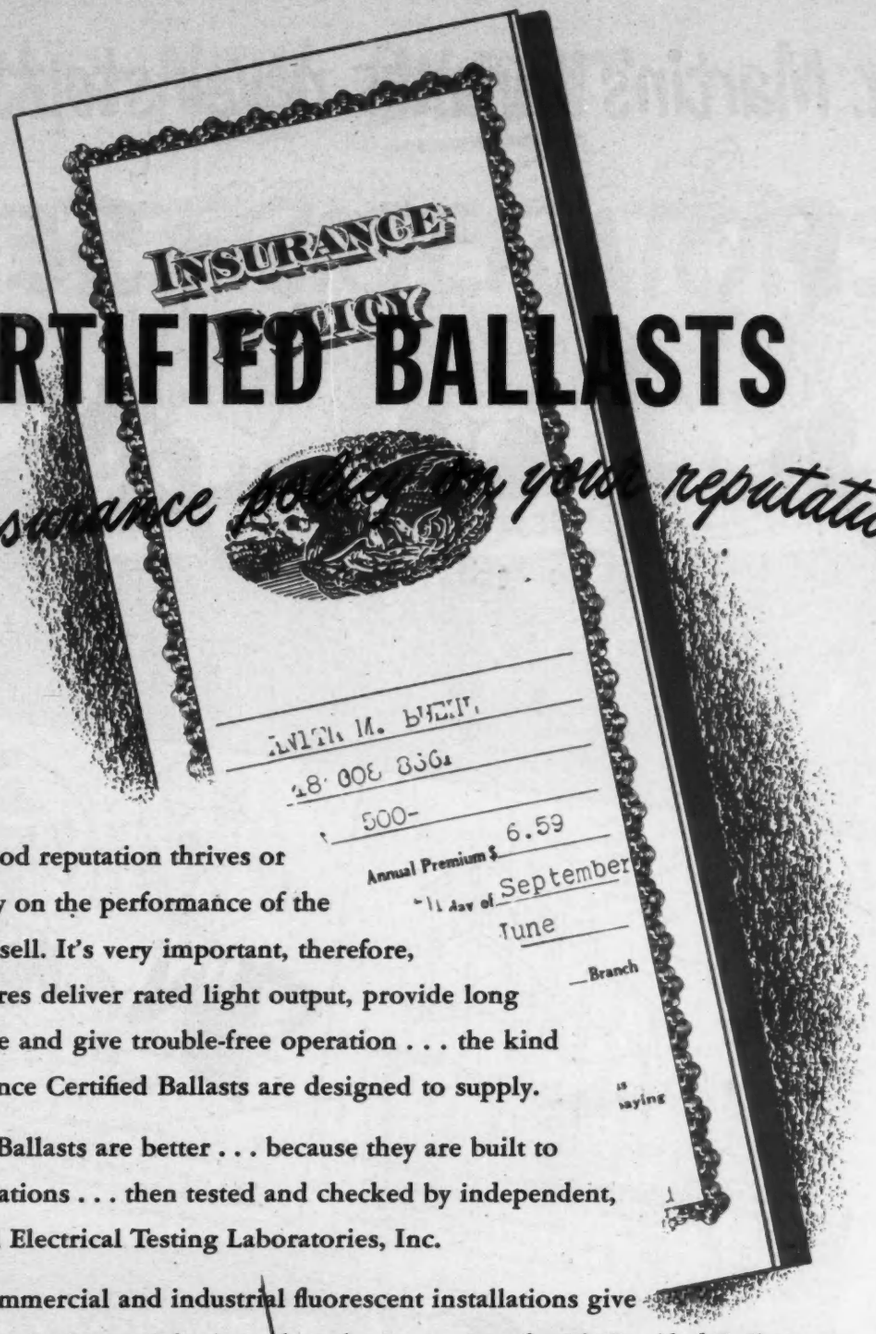
The Carrier Conduit Weathermaster System is the latest product of the engineering skill that *created* air conditioning . . . and has led the way to every important advance.

For years, Carrier engineers have teamed up with architects and their consulting engineers to provide the utmost in efficient and dependable air conditioning. Write for the booklet "Air Conditioning for Multi-Room Buildings." Carrier Corporation, Syracuse, New York.

Carrier AIR CONDITIONING • REFRIGERATION • INDUSTRIAL HEATING

CERTIFIED BALLASTS

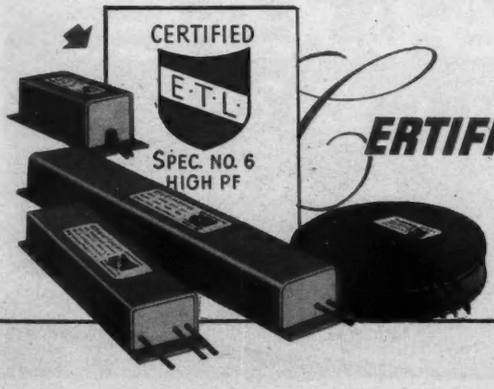
are an insurance policy on your reputation



Your good reputation thrives or falters largely on the performance of the fixtures you sell. It's very important, therefore, that your fixtures deliver rated light output, provide long lamp life and give trouble-free operation . . . the kind of performance Certified Ballasts are designed to supply.

Certified Ballasts are better . . . because they are built to rigid specifications . . . then tested and checked by independent, impartial Electrical Testing Laboratories, Inc.

That's why commercial and industrial fluorescent installations give more lasting satisfaction when they're equipped with Certified Ballasts.



● *All Fleur-O-Lier fixtures and Certified Lamps with circline tubes have Certified Ballasts.*

CERTIFIED BALLAST MANUFACTURERS

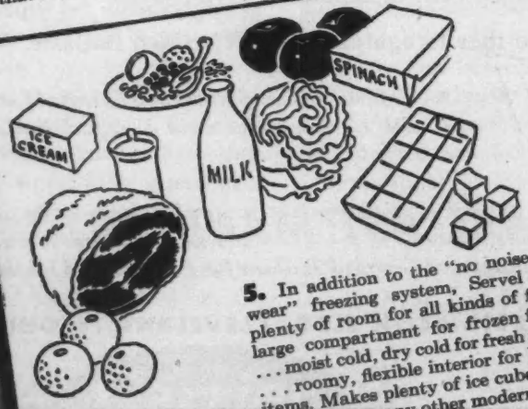
Makers of Certified Ballasts for Fluorescent Lighting

2116 KEITH BLDG., CLEVELAND 15, OHIO

Mr. Martin's tenants never stop thanking SERVEL

1. Mr. Martin heads a company that owns apartments. During construction of a new one last year, he decided he'd better put in his order for refrigerators. He hadn't given much thought to which make he would choose. He figured that any of the five or six leading makes would be a good buy.

2. All good refrigerators—Mr. Martin and his associates thought—offer pretty much the same modern features. BUT one day they were reminded that there is *one* refrigerator that offers something *more* than all others. Yes, *only the Servel Gas Refrigerator stays silent . . . lasts longer!*

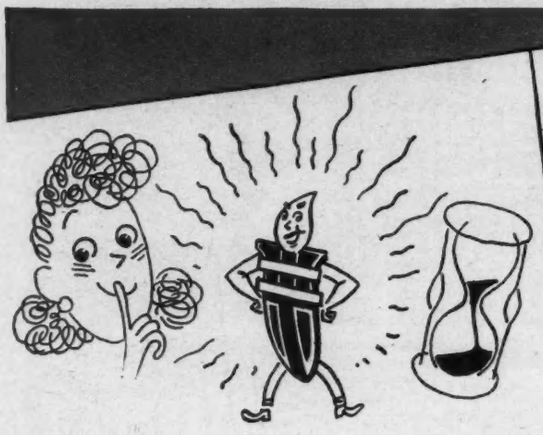


5. In addition to the "no noise, no wear" freezing system, Servel has plenty of room for all kinds of food; large compartment for frozen foods . . . moist cold, dry cold for fresh foods . . . roomy, flexible interior for bulky items. Makes plenty of ice cubes, too . . . and has many other modern cabinet features.

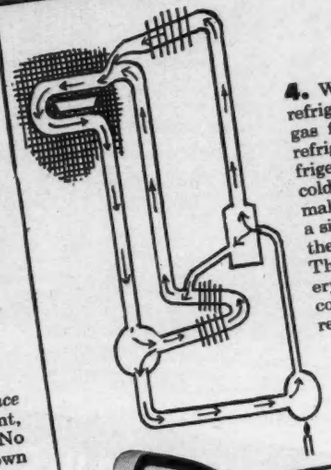
6. Mr. Martin checked Sweet's catalog and mailing pieces from the gas company. Yes, now he was ready to talk to that gas refrigerator salesman who had called on him before. The salesman came, gave the complete Servel story . . . and now Mr. Martin's tenants enjoy the advantages of Gas Refrigeration.

him for their NEW, SILENT GAS REFRIGERATORS

He also thanks himself, for Servel gives dependable service year after year . . . *at low cost*



3. Mr. Martin had heard the story of Servel's *difference* before . . . but now it really struck home: Servel stays silent, lasts longer, because it freezes with no moving parts . . . No machinery in the operating system to wear or break down . . . A tiny, silent gas flame does all the work.



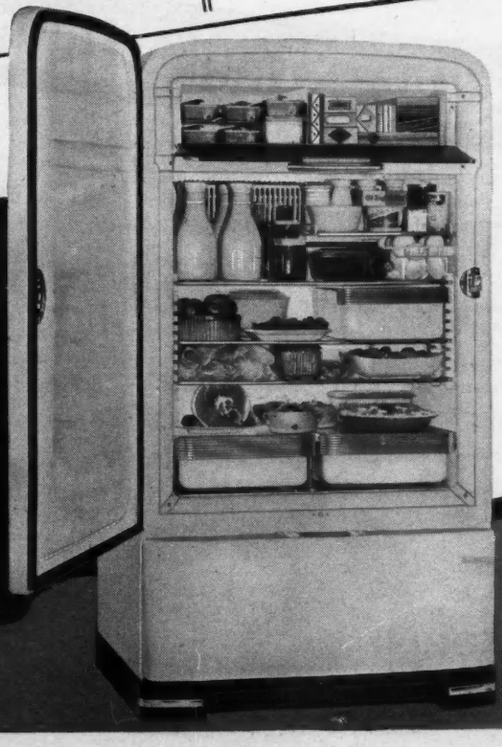
4. Why is Servel the different refrigerator? Because the small gas flame circulates a simple refrigerating liquid. This refrigerant supplies the constant cold that preserves food and makes plenty of ice cubes. Not a single moving part is used in the entire freezing operation. That means there's no machinery (no motor, no pump, no compressor, etc.) to ever need repair or replacement.

STAYS SILENT...LASTS LONGER

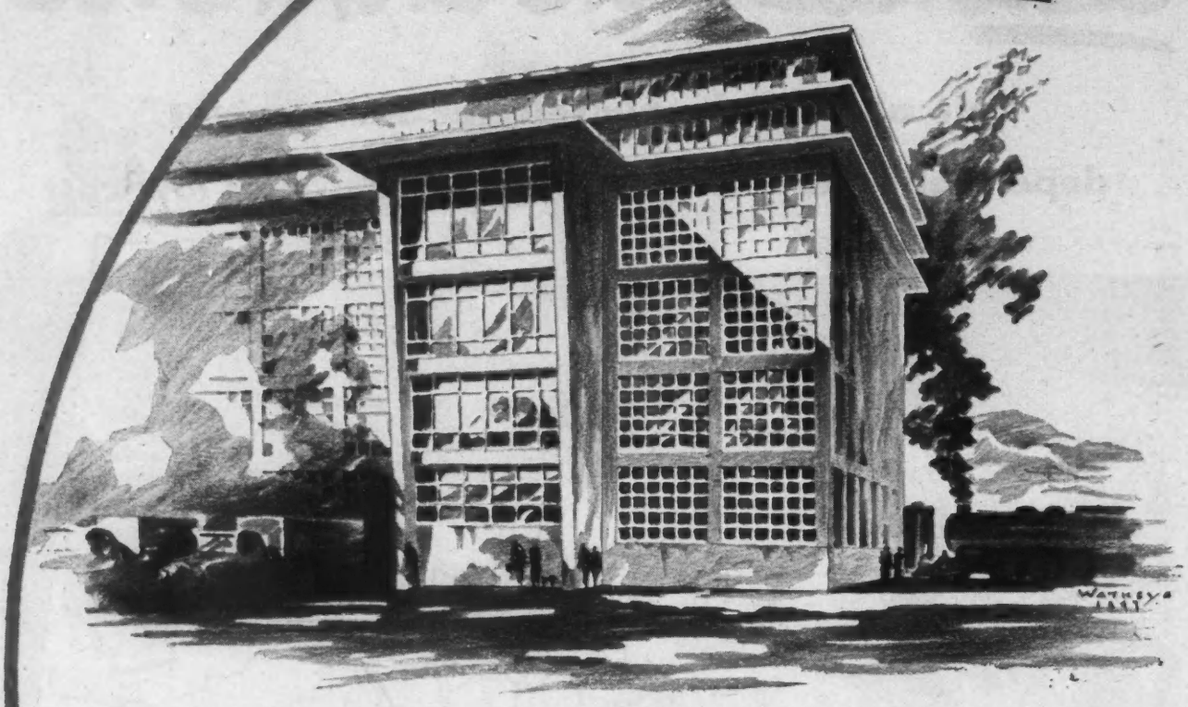
Servel

The GAS Refrigerator

SERVEL INC., EVANSVILLE 20, INDIANA



Gill & Bianculli design a factory . . .

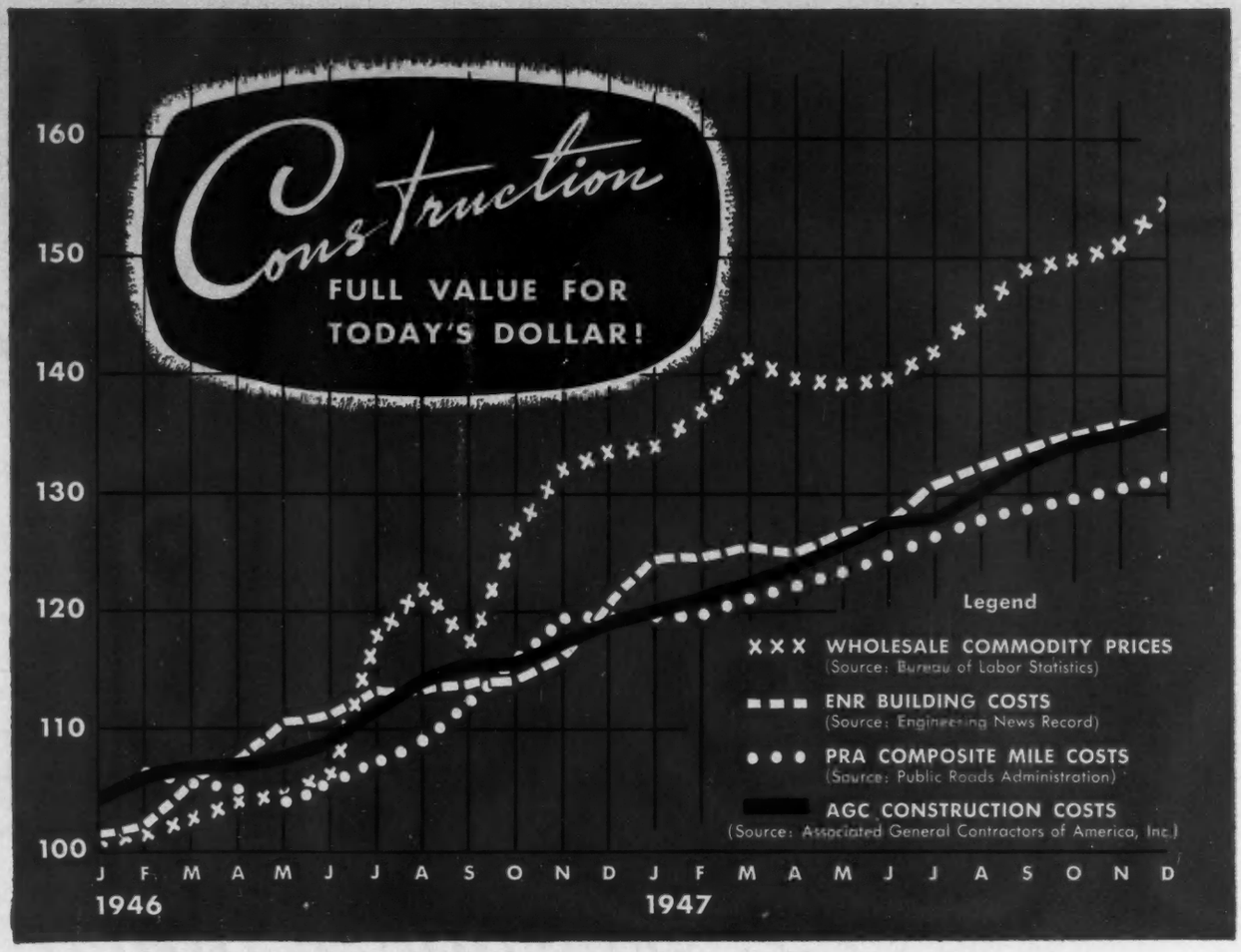


Mesker Steel Windows

"Steel windows are perhaps the greatest single contribution to modern industrial architecture. Skillfully used, they combine attractive appearance with efficient fenestration."

Architects
Harrison Gill, left
Mario Bianculli, right
Chattanooga, Tenn.

For your copy of the Mesker Book of Industrial Windows, write to Mesker Brothers, 4338 Geraldine, Saint Louis 15, Missouri



POST-WAR COMPARISON — *Construction Costs vs. Wholesale Commodity Prices (1945 Average = 100%)*

While commodity prices soared to a new high of 54% above 1945 wholesale market quotations, average construction costs were held to a 37% increase in 1947—and highway construction to 31.5%.

4,500 general contractors throughout the country, members of The Associated General Contractors of America, have been fighting to hold down construction cost lines to the lowest possible level for specified quality.

That's why Construction—America's second largest industry —*gives you full value for today's dollar!*

Early in 1947, the A.G.C. adopted a policy-program for a down-to-earth cost pattern. It is:

(1) To secure and quote *firm* prices whenever possible.

(2) To pay *fair and just wages* to workmen.

(3) To encourage workmen to *produce* a day's work for a day's pay; to *maintain* wage rates for an agreed-upon period of time; to *settle* disputes without work stoppage; and to *eliminate* wasteful practices.

(4) To *exert* every possible effort toward improvement of construction management and efficient operation.

(5) To *discourage* owners from demanding completion of projects at speeds which involve premium pay for overtime work or any procedure involving extra costs.

Costs cannot now be forced down to pre-war lows without national economic distress—but, a stabilization level is gradually being found through greater labor productivity, increased management efficiency, and through development of operational economies.

Members of The Associated General Contractors of America assume an obligation to work toward cost-stabilization—and fully recognize their responsibility to give the public its money's worth for its investment in construction.

SKILL — INTEGRITY — RESPONSIBILITY

The ASSOCIATED GENERAL CONTRACTORS of AMERICA, Inc.

More than 100 Chapters and Branches throughout America

National Headquarters — Munsey Building — Washington 4, D. C.

SKILL, INTEGRITY, RESPONSIBILITY IN CONSTRUCTION OF BUILDINGS, HIGHWAYS, RAILROADS, AIRPORTS, PUBLIC WORKS

Always on G

the DEPENDABLE METALS
Brass and Bronze

The BRASS and BRONZE INGOT INSTITUTE (formerly Non-Ferrous Ingot Metal Institute) recommends you to your local foundry for help with all casting problems.

CAST BRASS AND BR

For an inf
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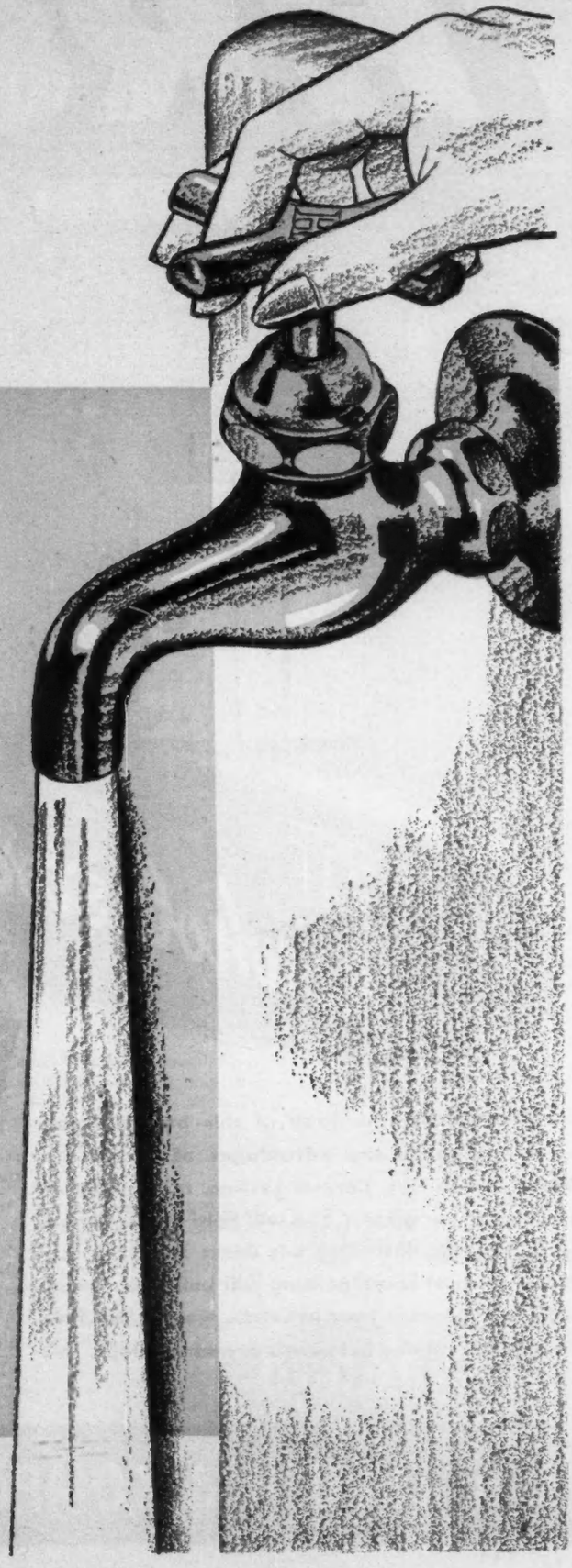


For an infinite variety of fixtures
and fittings in the plumbing, heating and
allied industries, Cast Brass and Bronze
are singularly durable and dependable.
Adaptable, too, to many finishes
by burnishing, plating, or chemical treatment.

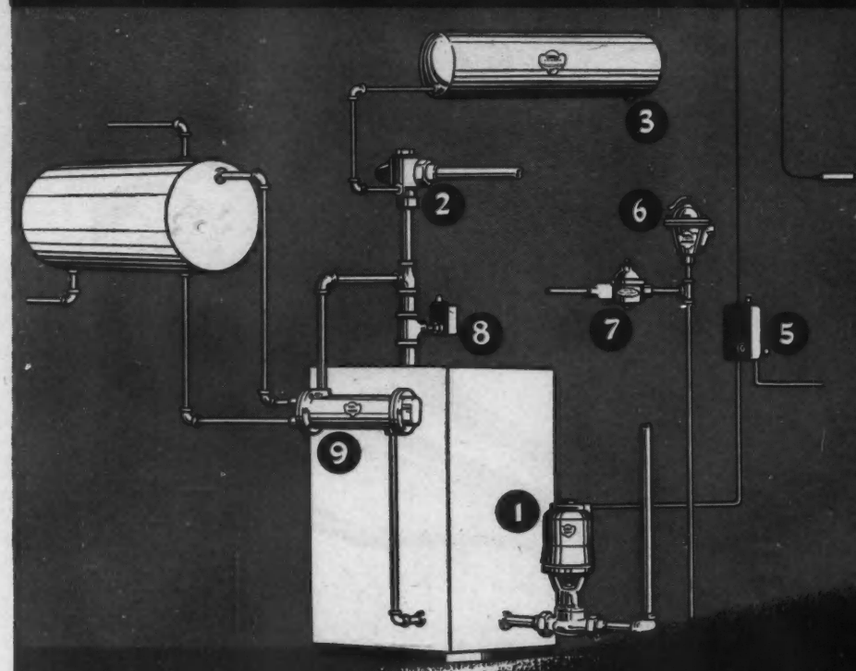
Product designers and engineers
specify Cast Brass and Bronze—time-tested
against corrosion and failure—
wherever uncontaminated flow
and certainty of control are imperative.

Long service at low initial and maintenance
cost have *always* been widely
recognized characteristics of these
"tough" twins.

Cast Brass and Bronze served the Emperors
of ancient Rome—serve the house
and the factory today; in truth,
they are *always* on tap . . .

You can *get* brass and bronze for casting NOW!

THRUSH



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2. Flow Control Valve
3. Pressure Tank
4. Radiant Heat Control
5. Relay Transformer
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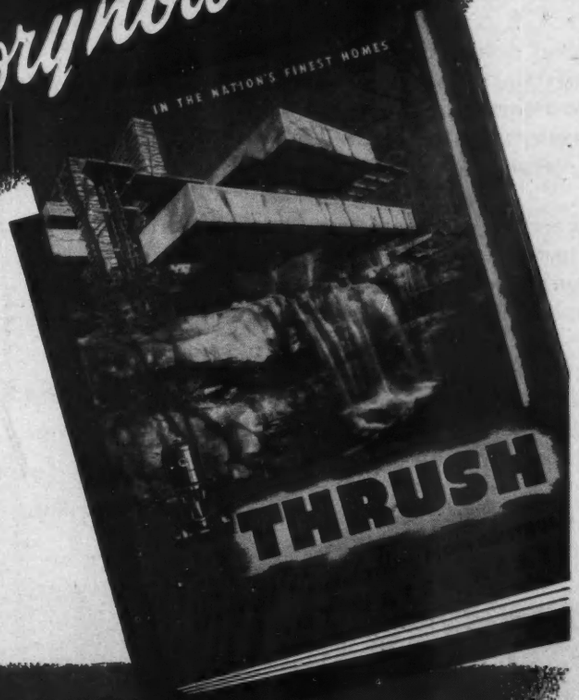
7. Automatic Filling Valve
8. Boiler Water Temperature Control
9. Thrush Water Heater

GET the whole story now!



WRITE FOR your copy of this beautiful new booklet giving all the advantages of Forced Circulating Thrush Flow Control System. It is written to appeal to home owners and will help you sell more Thrush Systems. Installing this finest and most economical form of home heating will build your reputation and increase your business. Get all the facts now. See our catalog in Sweet's or address Dept. J-3

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Whenever you want beauty *plus* convenience and durability, use this modern surfacing material. But be sure to specify Decorative Micarta*. That way you'll get *all 10* of these important advantages.

- **Won't scratch or mar** under ordinary service conditions. Finished surface is hard and durable.
- **Strong, dense material.** Guaranteed not to warp, chip or crack under ordinary service conditions.
- **Genuine wood veneers available.** Truwood Micarta combines the beauty of such woods as primavera, mahogany and walnut with all the practical features of Decorative Micarta.
- **Quickly and easily cleaned,** because of its permanently smooth surface.
- **Available in "cigarette-proof" grade** at slight extra cost. Even when cigarettes burn out on it, "cigarette-proof" Decorative Micarta remains unmarred.
- **Will not spot or stain** from spilled food, grease, alcohol, etc. Highly resistant to heat, moisture, mild acids and alkalies.
- **Color-fast, permanent finish.** Unusually clear, lustrous colors and patterns won't fade or darken.
- **Exclusive "Beauty Mask"** of tough Kraft paper protects surface during shipping, machining and installation. Strips off easily when ready for use.
- **Optional finishes.** Brilliant high-gloss or lustrous satin.
- **Large 4 ft. by 8 ft. sheets** of Decorative Micarta are available for covering large surfaces quickly, and with a minimum of joints. Smaller sizes also available for table tops and similar applications.

Sounds like almost an ideal surfacing material, doesn't it. Well, it is!

Don't fail to get complete information on Decorative Micarta *now*. Available in a variety of desirable colors and patterns. For samples and installation data, write:

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Weldwood Glue* and other adhesives
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The drop-forged Von Duprin exit devices you install this year are built to last the life of the building . . . to serve all the generations that are to come, as long as the structure stands . . . to provide over all these years the safest, fastest, surest exit ever known.
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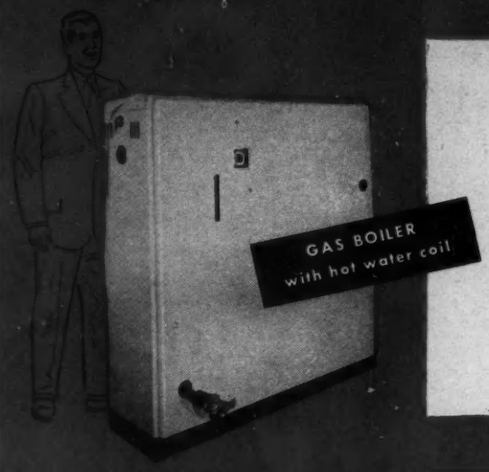


DOMESTIC HOT WATER COIL

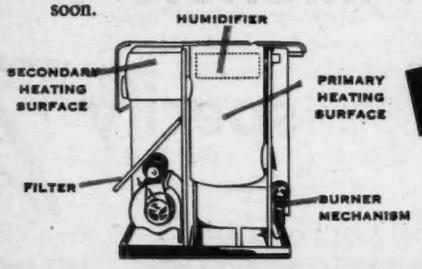
It's News!

Built-in domestic hot water coil optional. Same cast iron heating sections can be used with different sets of trim for hot water, steam or vapor heating systems. Eight sizes: from 95,000 Btu. to 325,000 Btu. input.

3 NEW LINES!

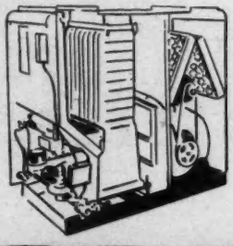
It's News!

Designed especially for small, low cost homes, this horizontal OIL burning unit comes completely assembled. Jacket finished in durable, heavy white enamel. Low pilot fire—as little heat as a gas pilot flame. Capacity: 75,000 Btu. Other oil units to be announced soon.



It's News!

Completely assembled when delivered, saves installation time. Jacketed in beautiful, heavy white enamel. Available in 8 capacities, from 90,000 Btu. to 420,000 Btu. input. Horizontal construction allows ample head room for low basements and ductwork.



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- √ Bright, cheerful, colorful interiors
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Facing Tile is available in a variety of light-reflecting colors —builds the wall and finish at the same time—will not crack, scratch or decay—does not harbor germs or dirt—cleans easily with soap and water—and now offers the economies and efficiencies of modular sizes.

NEW MODULAR FACING TILE HANDBOOK. Write to Desk AR-3 of the Institute for a copy of our new 90-page Modular Facing Tile Handbook showing methods of determining modular procedure. It's FREE to registered architects and engineers who write on their own letterheads. 50 cents to all others. See Sweet's or call on any Institute Member for more information.

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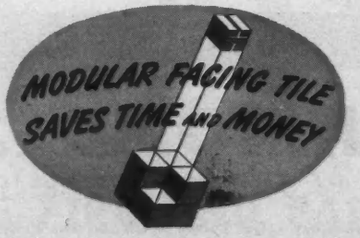
Charleston Clay Products Co., Charleston 22, West Virginia

Hanley Company, New York 17, N. Y.

Hydraulic Press Brick Co., Indianapolis, Indiana



Mapleton Clay Products Co., Canton, Ohio

INSTITUTE MEMBERS

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National Fireproofing Corp., Pittsburgh 12, Pennsylvania

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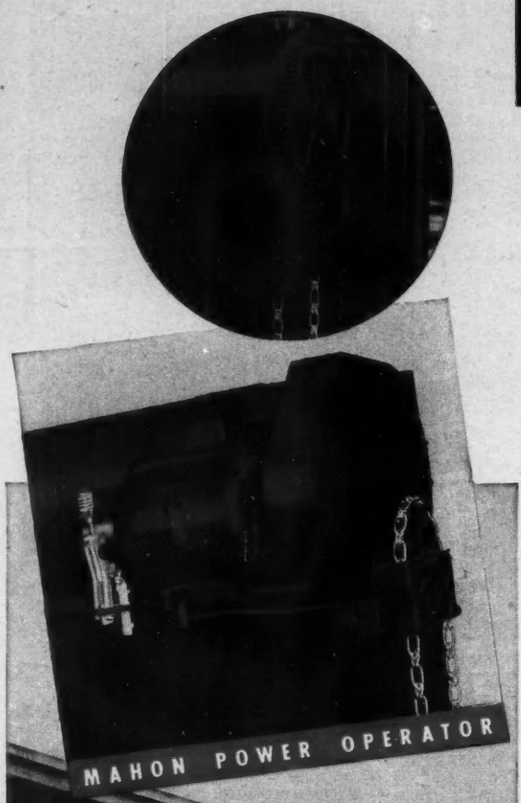
Standard Clay Manufacturing Co., New Brighton, Pa.

West Virginia Brick Company, Charleston, West Virginia

Rolling Steel DOORS



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For openings in industrial and commercial buildings there is no better answer than a good rolling steel door . . . their vertical action conserves space . . . they require virtually no maintenance, and they provide more positive protection throughout a lifetime of trouble-free service. A study of Mahon Rolling Steel Doors will reveal why they continue to gain favor among architects and owners throughout the United States and in many foreign countries. You will find, in Mahon Rolling Steel Doors, the latest developments in doors of this type . . . more compact and more practical operators, embodying many features exclusively Mahon—features that are very desirable from an every-day operating standpoint. See Mahon Insert in Sweet's Architectural or Engineering Files for complete information, or call in a Mahon representative.

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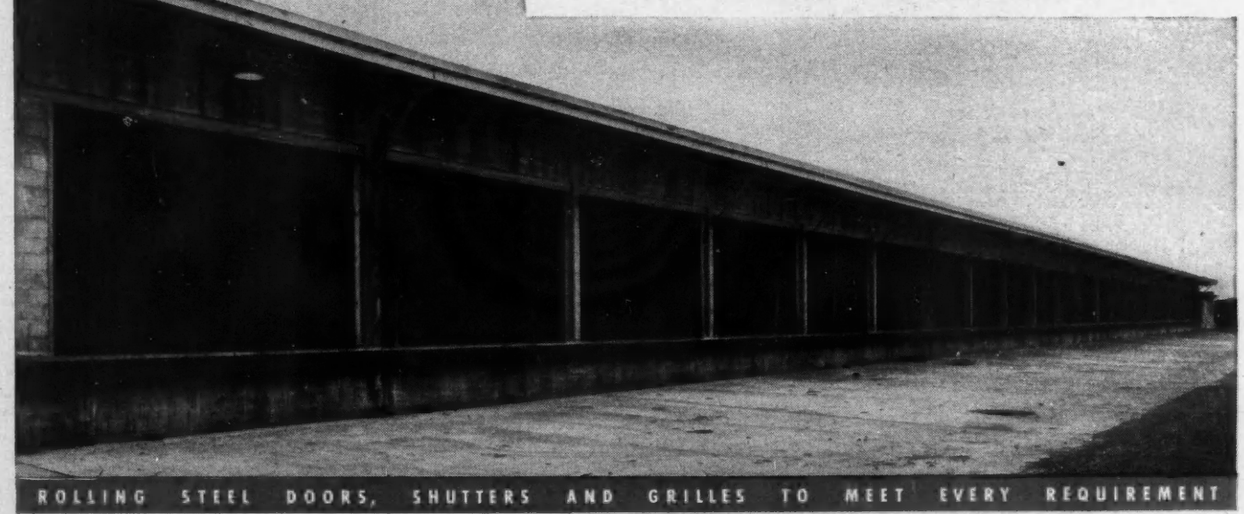

ROLLING STEEL DOORS, SHUTTERS AND GRILLES TO MEET EVERY REQUIREMENT

Twenty-two of Thirty Mahon Rolling Steel Doors Installed in a New Freight Transfer Dock for the Wabash Railroad, Detroit, Michigan.

MAHON

K&M "Century" ASBESTOS CORRUGATED

● Sidewalls of this Diesel engine house of the Santa Fe Railway at Barstow, Cal., were constructed of K&M "Century" Asbestos Corrugated.

for rugged industrial service

● Notice the "different" treatment given to this fashion salon with "Century" Asbestos Corrugated.

or decorative interiors . . .

Because it lasts indefinitely and toughens with age, *K&M "Century" Asbestos Corrugated* is ideal for industrial building construction, typified by the *Santa Fe Railway's* Diesel engine house at Barstow, California.

The corrugations provide structural strength sufficient to stand up under severe vibrations. And "Century's" asbestos-cement composition resists fire, weather, rot, rust and galvanic action. No painting or upkeep is needed.

More and more architects are finding that "Century" Corrugated's simple beauty lends itself readily to decorative interior schemes. Its neutral light gray color is pleasing to the eye . . . and can be used to strike either masculine or feminine motifs, as desired.

New "TOP-SIDE" Fasteners—available only with "Century" Asbestos Corrugated—cut erection costs on roof installations over steel purlin construction. These fasteners are applied wholly from the roof surface . . . hence no scaffolding or workmen are required beneath the roof. Result: exceptionally low application costs. Write for full details.

K&M best in asbestos ®

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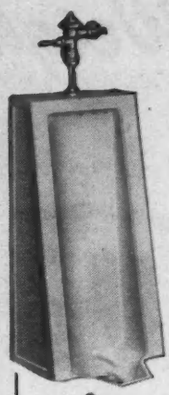
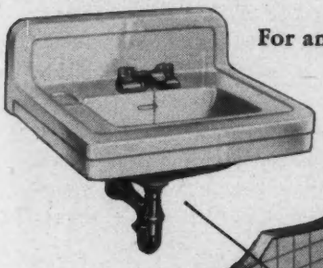
Here again Crane is the best known name in the field—and again with good reason. School authorities welcome the extra health safeguards with which Crane protects the students in their care. They like the easy-to-operate controls . . . Crane *Dial-ese* faucets, for example, that open and close at a touch from the smallest fingers. And, most of all, schools know Crane for *low-cost maintenance.*

For any questions you may have on the Crane school line, your Crane Branch has the answers.

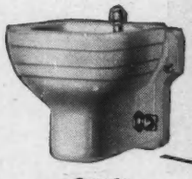


7-40 Sanitor Urinal

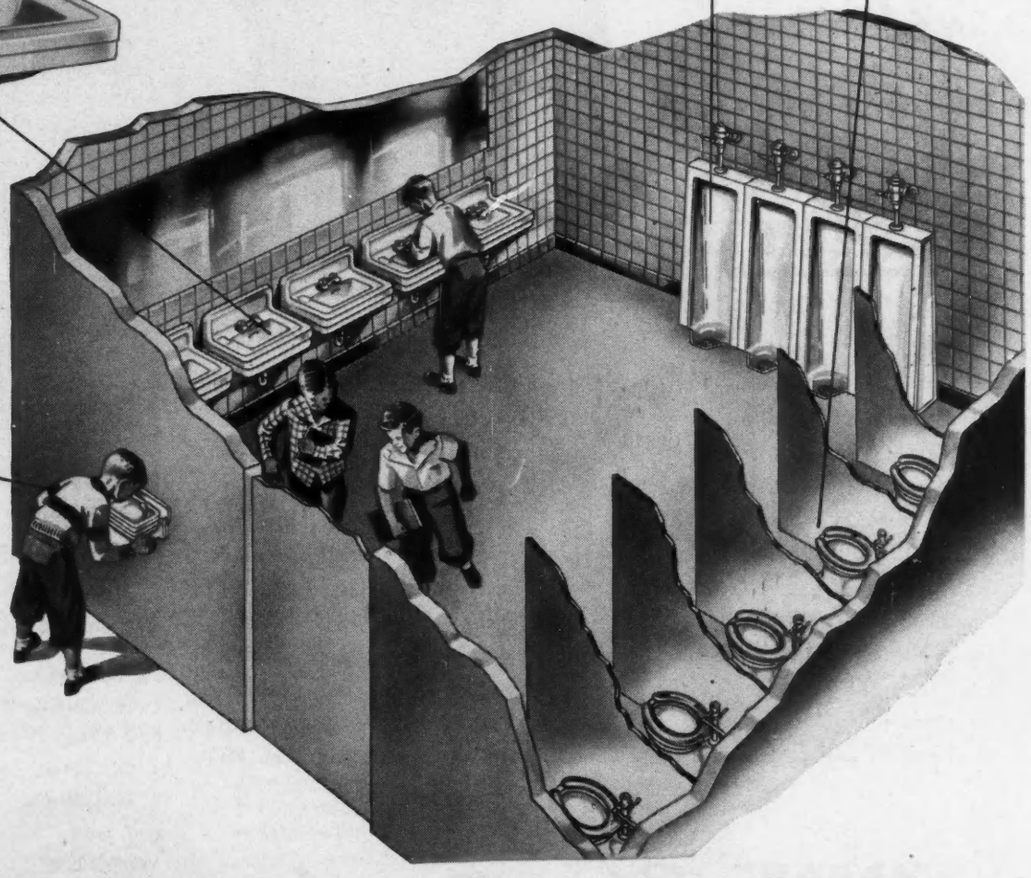
3-300 Santon Closet



1-241 Norwich Lavatory



C-9062 Corwith Fountain



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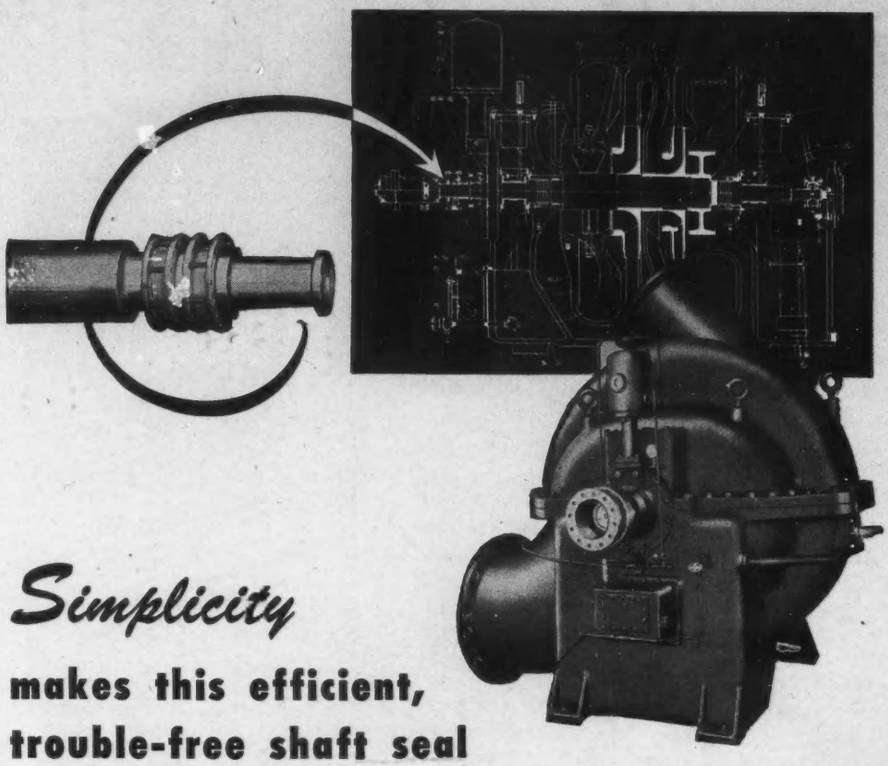

Simplicity

makes this efficient, trouble-free shaft seal

DIFFERENT

In the York Allis-Chalmers Turbo Compressor, leak-proof sealing is secured through impingement of stationary carbon rings on either side of a "Meehanite" seal ring which rotates with the shaft. The carbon rings are enclosed in nonferrous bellows secured to the compressor housing, and contact with the seal ring is maintained by spring pressure. Oil circulated by the main oil pump lubricates the rotating faces of the shaft seal and carries off the heat of friction. A gravity tank maintains an oil head on the seal when the compressor is idle. Since this high efficiency seal has few parts to get out of order, maintenance is negligible.

This unusual shaft seal is but one of the many exclusive design features of the York Turbo Compressor and is representative of the thoroughness of York engineering throughout its complete line of refrigeration and air conditioning equipment. York Corporation, York, Pa.

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YORK *Refrigeration and Air Conditioning*

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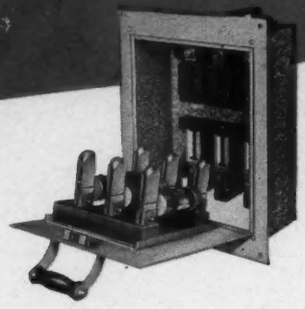
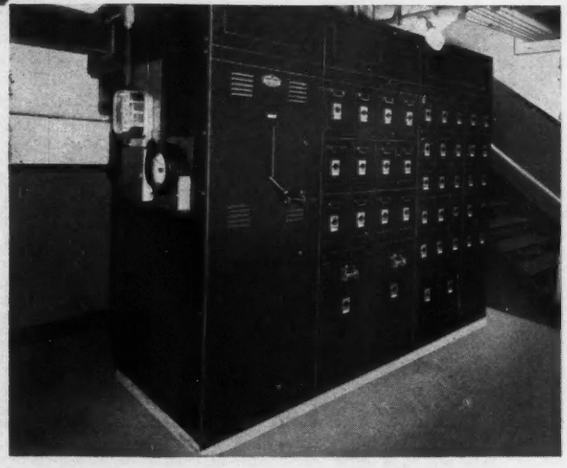
provide increased capacity . . . greater efficiency . . . safer operation



This safety-type FA Klampswitchfuz combines both disconnect switch and fuse protection into one unit . . . for more perfect contact and safer maintenance. Heavily silvered copper contacts are "squeezed" together in one locking motion that clamps fuses at the same time. Access to fuses can be made only when door is open . . . preventing hands from coming into contact with live parts.



REPLACING obsolete, dangerous, live-face equipment, these recent installations of FA Klampswitchfuz Switchboards are fine examples of electrical modernization.

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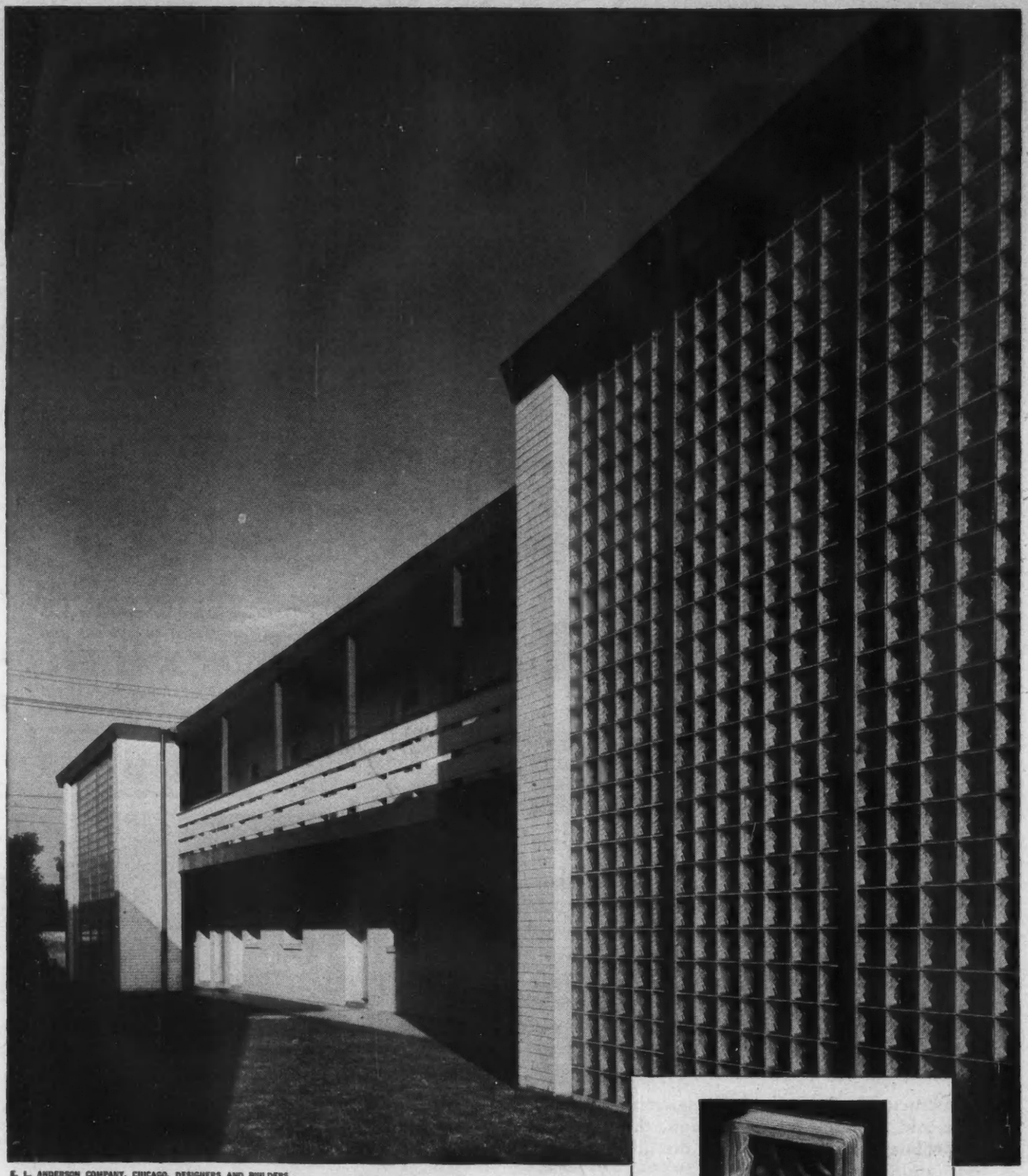

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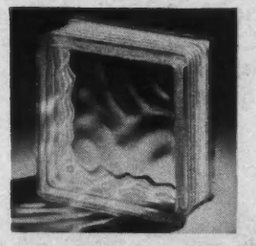
American Structural Products Company is a wholly owned subsidiary of the Owens-Illinois Glass Company. It has taken over the manufacture and sale of Insulux Glass Block and other Owens-Illinois structural products. For information, address Dept. E-4, P.O. Box 1035, Toledo 1, Ohio.



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CONCRETE SUBFLOOR PREPARATION FOR RESILIENT FLOOR INSTALLATIONS

When resilient flooring is to be specified for installation over a concrete subfloor, several factors require consideration on the part of the architect before drawing up the specification. These factors not only will have an effect on the appearance and wearability of the finished floor but also will have a bearing on the type of resilient flooring material to be specified.

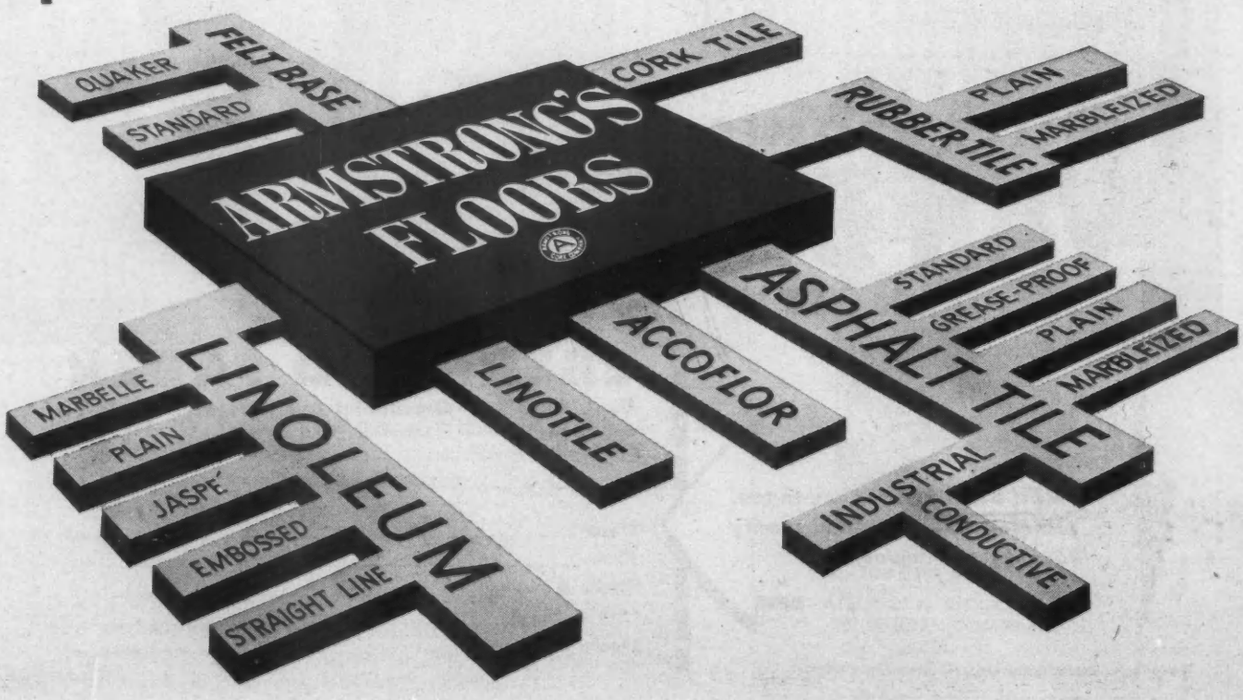
If the concrete subfloor is on or below grade, an alkali-resistant flooring such as asphalt tile should be specified. Resilient flooring materials that are affected by alkaline moisture do not perform satisfactorily on concrete in contact with the ground. For installation over suspended concrete with adequate ventilation underneath, any of the resilient floors—linoleum, Linotile®, rubber tile, cork tile, or asphalt tile—can be specified for a satisfactory installation.

Another point that should be taken into consideration is the age and condition of the concrete subfloor. A newly installed suspended concrete subfloor should be thoroughly dry all the way through the thickness of the slab before linoleum, rubber tile, Linotile, or cork tile is laid. Depending upon the weather and climate, it may take as long as several months for a new concrete subfloor to dry completely. Concrete with a hard, glazed finish or concrete that has been excessively troweled may require a longer time to dry. Such a finish retards the evaporation of the moisture in the concrete. Concrete having a cinder aggregate also requires a long drying period because it retains considerable water.

A test to determine the moisture content of new concrete is illustrated and described in Fig. 2. If excessive moisture is found, additional time should be allowed for the concrete to dry. If, for some reason, this waiting period is impractical, asphalt tile can be specified for installation as soon as the concrete is dry on the surface and hard enough to walk upon.

Old concrete subfloors, regardless of whether they are on or below grade or suspended, should be examined by the architect to determine their condition before the resilient flooring is installed. The concrete should be examined for cracks, score lines, spalling, and high or low spots which will require repairing or leveling. If oil, wax, paint, or varnish is on the surface of the concrete, it should be removed. Otherwise, the adhesive for the resilient flooring will not bond properly to the subfloor.

Since all resilient flooring materials will conform to irregularities in the subfloor, it is necessary for the concrete to be as smooth and level as possible for the best appearance of the



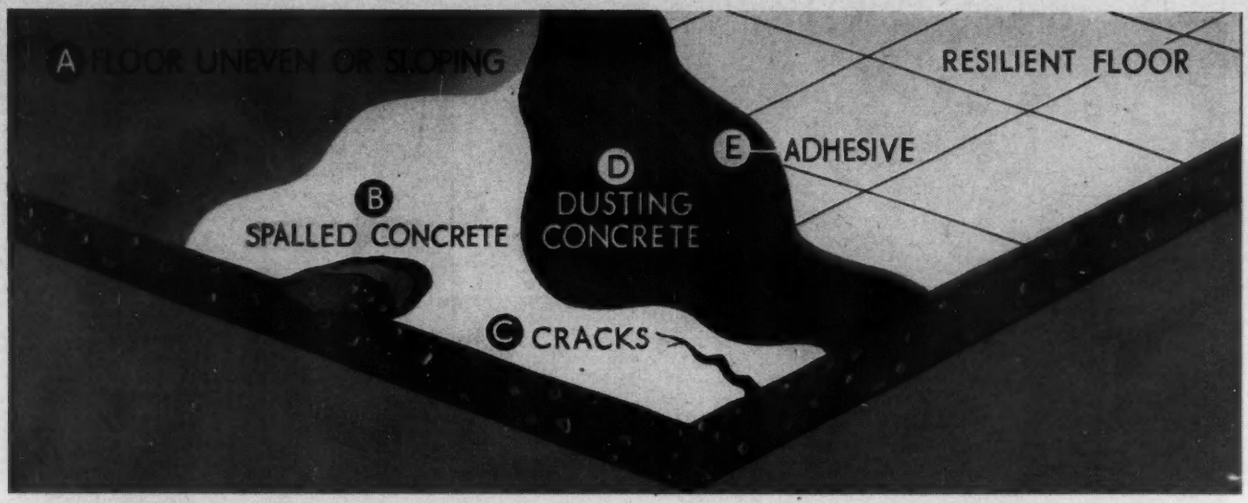


FIG. 1—This composite illustration shows the treatments necessary to correct the most common defects in old or worn concrete subfloors before the installation of resilient flooring. Uneven sections of the floor (A) are leveled with floor fill applied in the manner of a concrete topping. Holes caused by spalling or powdering (B) can be repaired with a cement crack filler. Cracks and score lines (C) also can be smoothed with an application of crack filler. Dusty concrete (D) requires priming or sizing before applying the adhesive (E) for the installation of the resilient floor.

finished floor. Rough concrete can be smoothed with a grinding machine. If the concrete is too rough or uneven to smooth out in this manner, a floor fill underlayment should be applied as illustrated in Fig. 3.

Floor fill is a concrete-like mix made of cement, sand, crushed stone or gravel, water, and an asphalt emulsion such as Armstrong's Flormastic. Such a floor fill is strong and light in weight. While the usual application of this type of floor fill is from one-half to one inch in thickness, it can be used satisfactorily and economically up to two inches in thickness. The use of Flormastic in the mix makes it possible to trowel the fill down to a featheredge which is highly desirable when leveling is required only on parts of the floor. It also reduces the possibility of the fill cracking.

Cracks, score lines, and broken spots caused by spalling also require repair to avoid the possibility of having these irregularities mar the smoothness of the resilient flooring. Defects of this type usually can be corrected by patching the concrete with concrete crack filler. Armstrong's Crack Filler is made up in powder form to which just enough water is added to make it workable. It is easily applied with a putty knife.

Chalky or dusty concrete also requires treatment before installing resilient flooring. Such a condition, which prevents the adhesive from bonding to the concrete, can be overcome by sizing or priming the concrete. Suspended concrete that is chalky or dusty should be treated with a primer such as Armstrong's Floor and Wall Size. Concrete in contact with the ground should be primed with an asphaltic primer such as Armstrong's No. S-80 Primer.

The conditions mentioned on these pages are those most commonly encountered in the installation of resilient flooring over concrete subfloors. For information pertaining to unusual conditions, or for answers to any other questions relating to the installation or design of all types of resilient floors, phone or write to any Armstrong office or write directly to Armstrong Cork Company, Floor Division, 2403 Duke Street, Lancaster, Pennsylvania.

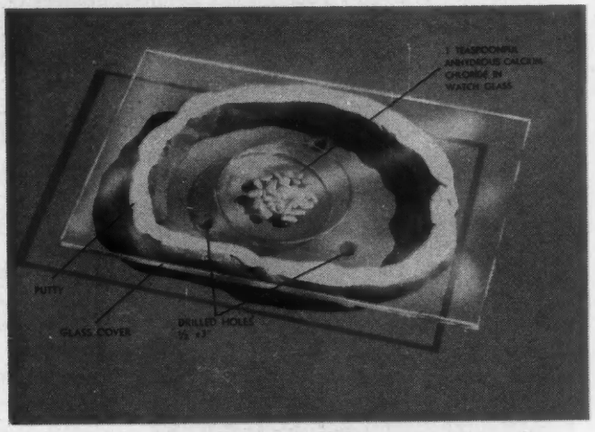


FIG. 2—Newly poured suspended concrete can be checked for moisture content with this test. If the calcium chloride crystals dissolve within 24 hours, moisture in the concrete is too great for immediate installation of resilient flooring materials that are affected by alkaline solutions.

FIG. 3—Floor fill is mixed and applied to the floor like concrete topping. Wood screeds control thickness of the fill which is leveled with a straightedge. The surface of the fill is smoothed with a trowel and, where necessary, it can be troweled to a featheredge.

LEFT:
GRAMERCY:
K—1860-BA, Sizes 24 x 20" and 22 x 18".

RIGHT:
STRAND:
K—1870-BA. Sizes 26 x 15½" and 20 x 14".

LEFT:
GREENWICH:
K—1950-J. Sizes— 24 x 20" and 20 x 18".

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The Gramercy and Chesapeake, both popular lavatories, are available in two sizes, with or without legs. Both are shelf lavatories, as also is the Strand, designed especially for small, narrow rooms. The Jamestown is available with pedestal as well as with legs. The Greenwich combines smartness and low cost.

LEFT CENTER:
CHESAPEAKE:
K—1910-C. Sizes 24 x 20" and 20 x 18".

LEFT:
JAMESTOWN:
K—1780-F. Sizes 27 x 22", 24 x 20" and 20 x 18".

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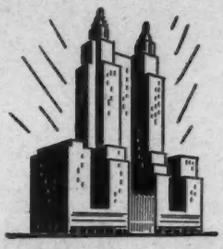

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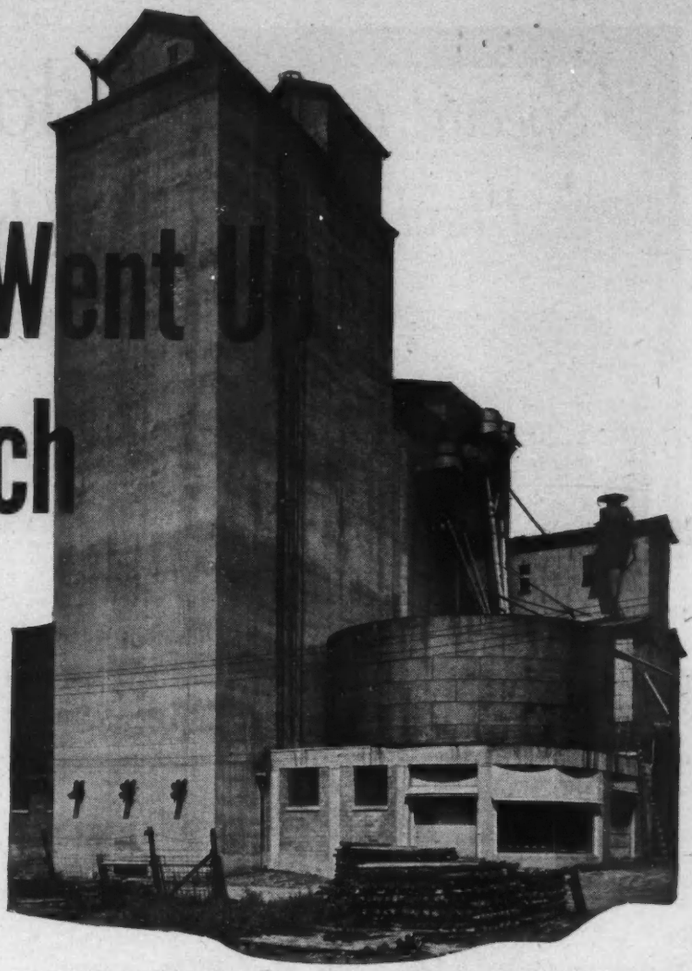
The Elevator Went Up Without a Hitch

on this Slip-Form construction job

...with Duraplastic



Duraplastic air-entraining cement used exclusively on this grain elevator of Delphos Grain & Milling Co., Delphos, Ohio. Engineer and Architect, R. C. Reese, Toledo, Ohio; Contractor, Green and Sawyer Co., Lima, Ohio.

Another grain elevator built fast and clean with Atlas Duraplastic air-entraining cement. Further proof that the greater workability of Duraplastic makes it ideal for slip-form work.

Because it makes a more plastic, more uniform, more cohesive mix, Duraplastic saves time and work in placing and finishing. Requiring less water for a given slump, Duraplastic minimizes segregation and bleeding.

Duraplastic works as well for paving, structural, and mass concrete as it does for slip-form construction. No unusual changes in procedure are required. A denser, more durable concrete results.

Duraplastic complies with ASTM and Federal specifications...sells at the same price as regular cement...makes better concrete at no extra cost. Send for further information. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

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AR-D-59

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Sarcotherm
WEATHER CONTROL

FOR HOT WATER AND RADIANT HEATING

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IN "FRESH MEADOWS" TOO

It's Bruce Block Floors!

FRESH MEADOWS, owned and operated by the New York Life Insurance Co., is a new trend in large apartment projects. Located on a 170-acre tract of land, it includes 138 two- and three-story and two thirteen-story structures. Two-story units contain duplex garden apartments; three-story and thirteen-story buildings have 3½ and 4½-room apartments. Principals in the planning and construction of Fresh Meadows are: *Architects*—Voorhees, Walker, Foley and Smith; *General Contractors*—George A. Fuller Co.; *Flooring Contractors*—Builders' Wood Flooring Co.

■ Thirteen miles from Manhattan, this modern residential community is now well underway in Queens, Long Island, New York. When completed early in 1949, Fresh Meadows will be "home" for about 3,000 families.

In Fresh Meadows—as in Parkchester, Stuyvesant Town, Clinton Hills, and other leading apartment projects—Bruce Blocks have been used. This modern type of hardwood floor has these advantages for apartments with concrete slab floor construction:

EASILY INSTALLED—Blocks are quickly installed over concrete by laying in mastic. No wood subfloor or screeds.

DURABLE—This solid hardwood flooring is good for the life of a building—can easily be restored to its original beauty by refinishing when necessary.

BEAUTIFUL—Distinctive patterned design gives a modern touch, adds style and decoration to apartments.

EASILY MAINTAINED—It's easy to keep Bruce Blocks clean and beautiful, particularly when they're finished the "Bruce Way."

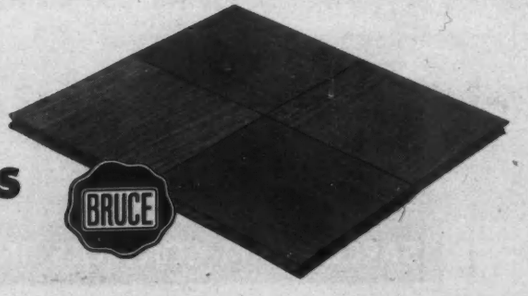
COMFORTABLE—Resilient, warm, comfortable underfoot, a Bruce Block Floor is sound-absorbing too.

Bruce Blocks are so popular that production cannot match present demand. Specify on projects being planned for future construction. See our catalog in Sweet's.

E. L. BRUCE CO., MEMPHIS, TENN. • WORLD'S LARGEST MAKER OF HARDWOOD FLOORS

Bruce Block

HARDWOOD FLOORS



How G-E lamps make merchandise

easier to see...

easier to buy!

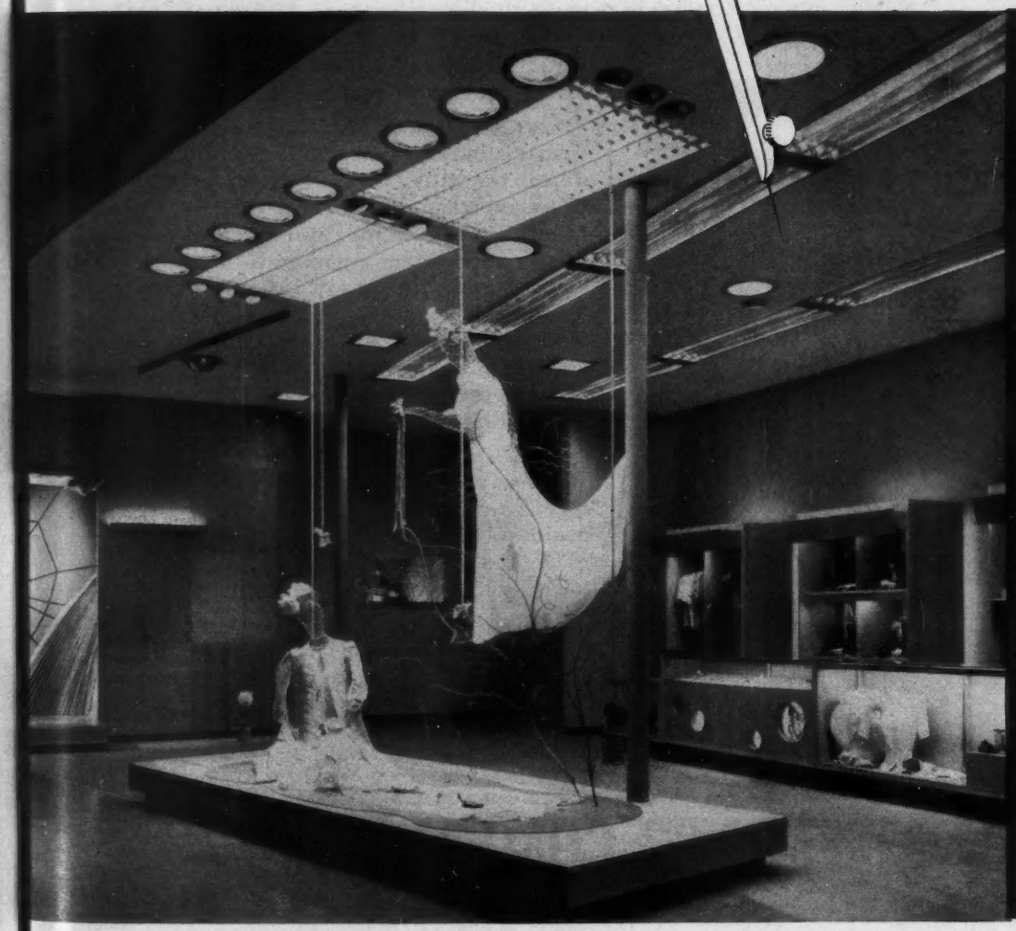
This specialty shop exhibit at the General Electric Lighting Institute, Nela Park, Cleveland, shows dynamically how the "3 A's of Store Lighting" may be applied to move merchandise.

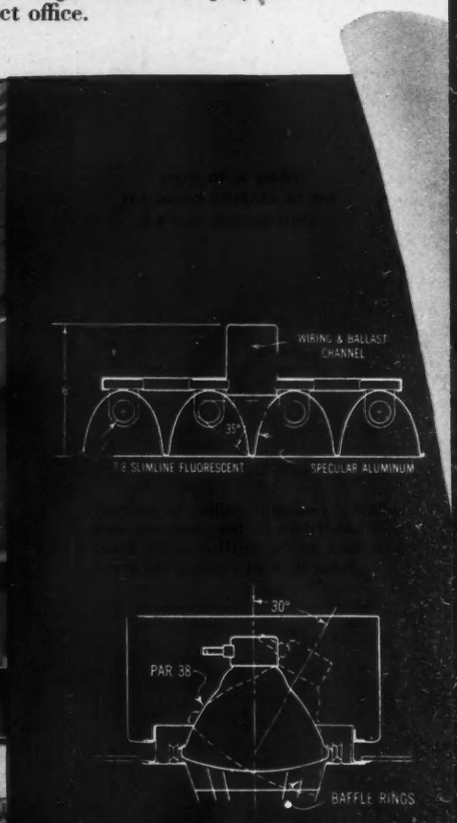
1. ATTRACTION is achieved by emphasis lighting with G-E fluorescent lamps in floor and wall case displays. Accents and highlights are superposed with reflector and projector spot lamps mounted in recessed fixtures.

2. APPRAISAL illumination, using both fluorescent and filament lamps, may be set from 30 to 120 footcandles, providing correct conditions for quick, accurate buying decisions.

3. ATMOSPHERE lighting combines blue, gold, pink, daylight and 4500° white fluorescent lamps housed in the wall case tops. Perimeter lighting creates feeling of spaciousness.

For the latest in lighting ideas, tools and techniques, architects are invited to visit the G-E Lighting Institute. Make arrangements through your nearby G-E Lamp district office.

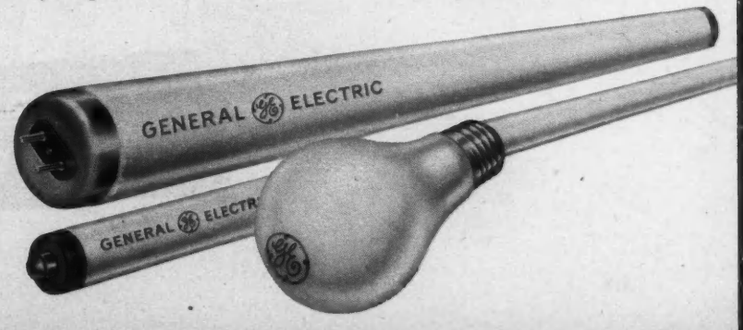


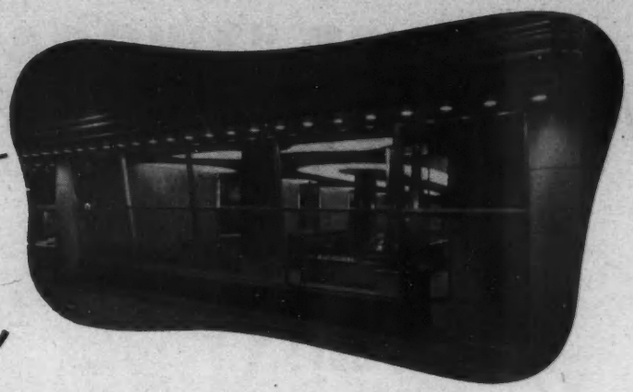


For successful lighting, always specify **G-E Lamps** . . . constantly improved by G-E research to **STAY BRIGHTER LONGER**

G-E LAMPS

GENERAL ELECTRIC





Super-clean air

served with every meal

THIS new restaurant of Clark's Lunch Room, Inc., South Bend, Ind., is modern from the entrance way right back to the all-electric kitchens. And out of sight, but always on the job, is an AAF Electro-Matic* Electronic Precipitator which delivers air to match the quality of their service.

Clark's Restaurant, South Bend, Ind., features modern air conditioning system equipped with AAF Electro-Matic Electronic Precipitator.

Soot, dust and smoke can soon make the smartest interiors look dull and shoddy—defeat the most careful efforts to serve clean, appetizing food. There's the problem of tobacco smoke, too. Multiply the output of one after-dinner cigarette by a hundred and you have a threat to customer comfort. The AAF Electro-Matic removes this as well as incoming smoke and permits the air conditioning system to function properly with the correct ratio of recirculated and outdoor air.

Clean air is not a luxury but a sound investment measured in actual dollar savings that are attractive to the small and large businesses alike. And the recommendation of AAF Electronic Precipitators to your clients will assure them maximum benefits.

There's an American Air Filter of a type and capacity to solve every air cleaning problem. Complete catalog data may be obtained from your local AAF Representative or by writing direct to—

**Automatic Electronic Precipitator*

AMERICAN AIR FILTER COMPANY, INC.

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AND DUST CONTROL EQUIPMENT

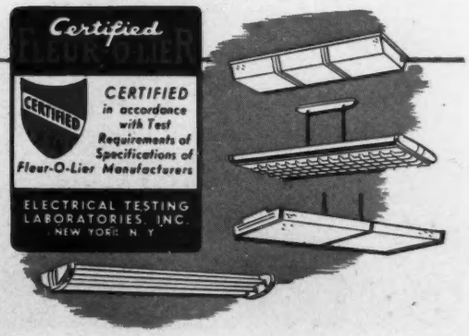
5 Reasons why you will recommend FLEUR-O-LIER

Fleur-O-Lier's advantages are so clear, so simple, that you will want to recommend them to your customers. The important benefits are:

1. Every Fleur-O-Lier fixture delivers fine lighting performance.
2. Long, trouble-free service assures customer satisfaction.
3. Each manufacturer offers individual styling and design, but every fixture meets exacting specifications for lighting, constructional and electrical excellence.
4. Conformance to these rigid specifications is safeguarded by impartial Electrical Testing Laboratories, Inc., which checks and tests Fleur-O-Lier fixtures.
5. Fleur-O-Lier offers a *Product* and a *Program.* The product is tops. The program promotes and develops commercial fluorescent lighting—elevates lighting standards to higher levels.

Everybody benefits from Fleur-O-Lier—*you and your customers.*

✱ *Every Fleur-O-Lier fixture uses Certified Ballasts and Certified Starters.*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in accordance with Test Requirements of Specifications of Fleur-O-Lier Manufacturers
ELECTRICAL TESTING LABORATORIES, INC.
NEW YORK, N. Y.

FLEUR·O·LIER

Manufacturers

2116 Keith Building • Cleveland 15, Ohio

Fleur-O-Lier is not the name of an individual manufacturer, but of a group of fixtures made by leading manufacturers. Participation in the Fleur-O-Lier program is open to any manufacturer who complies with Fleur-O-Lier requirements.

STAINLESS STEEL

You're Looking at Her Dream

What is a woman's dream kitchen made of? All sorts of time-saving gadgets to be sure, but it must be a place of beauty as well — something to show off to friends. That's why housewives like sinks and cabinet tops, as well as pots and pans, of stainless steel. They like this bright metal because it has lasting beauty; its smooth surface is easy to clean and can't chip or peel. For ideas on how to use stainless steel, write to Department A3 for our monthly publication ELECTROMET REVIEW.

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

PRODUCERS OF ALLOYS THAT MAKE STEEL STAINLESS

Beautiful Enduring Strong Tough

"and of course you'll install Salter MASTERPIECE FIXTURES!"

This preference for Salter Masterpiece Fixtures is fast becoming a common expression when plumbers, builders, architects, and home owners select brass plumbing trim and fixtures. And for good reason too . . . since thousands have discovered that Salter quality of design, appearance, and construction plus exclusive "EZE" close operation are unparalled. Standardization of fixtures and parts meet today's modern specifications . . . and precision production and testing equipment maintain masterpiece craftsmanship which further assures complete user satisfaction. The Salter Masterpiece Line embodies many types and styles for the bath, lavatory, kitchen and laundry, as well as the valves and fittings necessary in the basic supply installations. For complete description and specifications. write today for the new Salter catalog.

Also ask about the New Line of Salter Feather-Touch Fixtures which feature today's simplest and softest closing valve . . . It's revolutionary!*

H. B. Salter MFG. CO., Marysville, Ohio

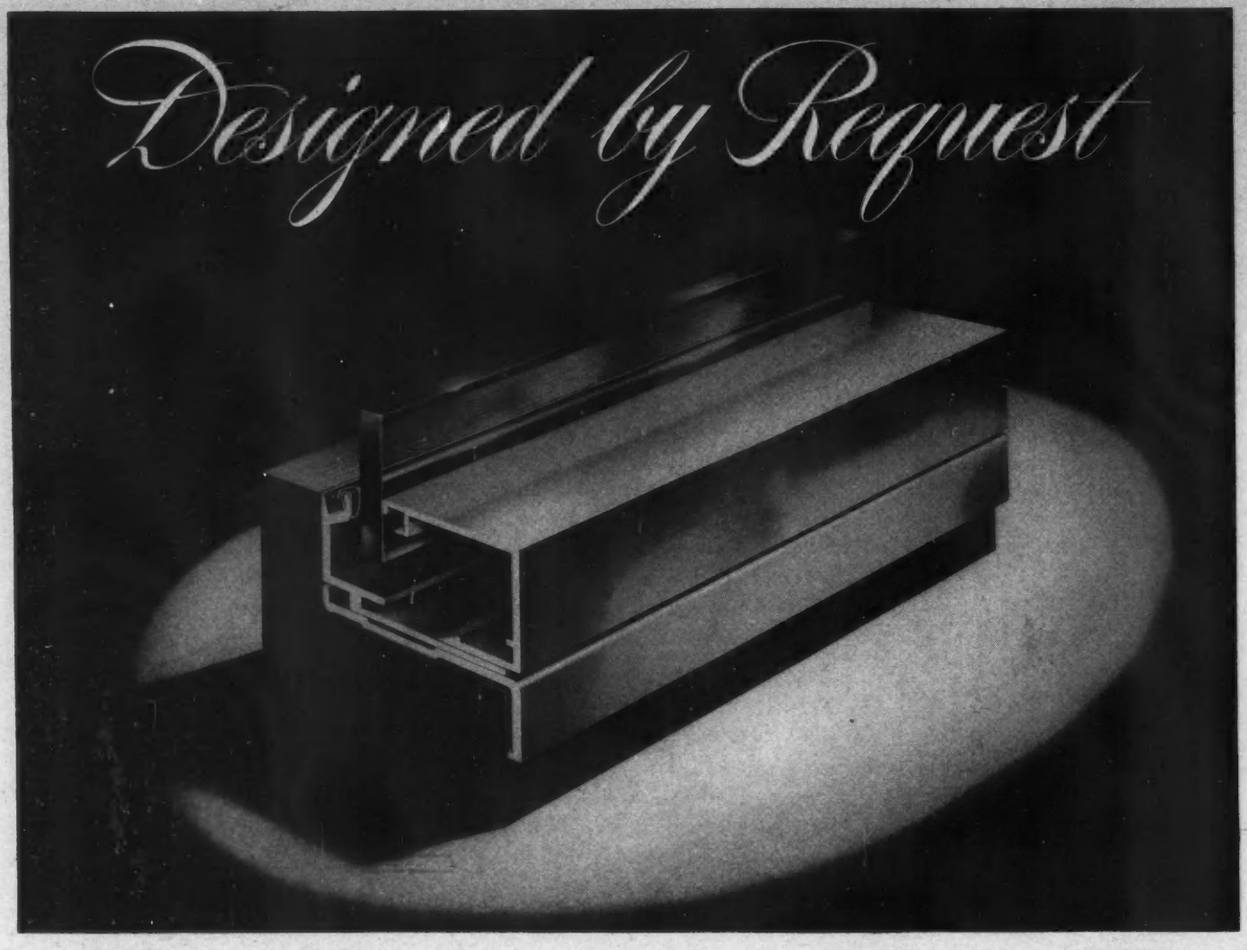
and Division THE GLAUBER BRASS MFG. CO., Kinsman, Ohio

* PATENT PENDING

Above— Gothic Plate Diverter Bath and Shower Fixture on 2¾" centers with Presto shower head, arm and flange. Long-life "EZE" close valve construction.

Right— Masterpiece 3 Valve Diverter Bath and Shower Fixture complete with Shower King head, arm and flange with easy-to-install trip-lever or pop-up waste. "EZE" close Valve construction.

Below— Masterpiece Automatic 2 Valve Bath and Shower Fixture on 8" centers. Body adjustable for 1" roughing in variations. Available in two styles of trim. "EZE" close valve construction.



a NEW SASH in Pittco De Luxe Store Front Metal

This new sash (Pittco De Luxe 12C) was designed to meet demands for a plain, rectangular sash to harmonize with certain modern store front designs. It is styled to blend with and complement the many mouldings in the Pittco De Luxe line. It is finished with the same satin-smooth richness which has made De Luxe so pleasing to architects and owners alike. And its extruded method of manufacture assures rugged strength and a clear, sharp profile. Pittco De Luxe offers a wide variety of impressive combinations for top quality installations.

Where economy is of prime importance, Premier, the other Pittco line of store front metal, is the ideal choice. It embodies the same perfection of finish as Pittco De Luxe, but it is lighter in weight and provides a shallower reveal for show windows. It can be set more quickly and easily than any other metal construction.

PITTCO
STORE FRONT METAL

"PITTSBURGH" stands for Quality Glass and Paint

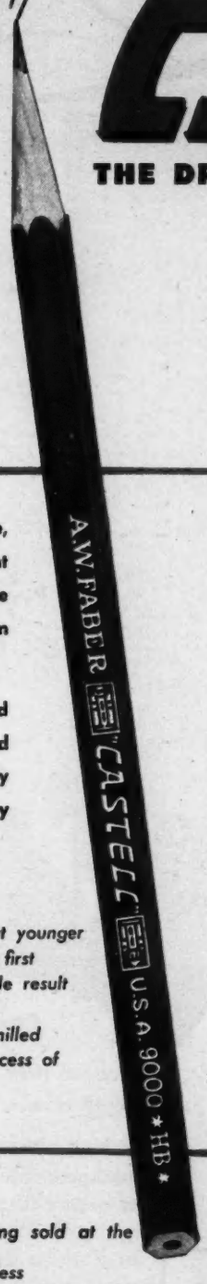
PITTSBURGH PLATE GLASS COMPANY

WALTER HESSE, one of the many distinguished architects, who

"Welcome Back"

CASTELL

THE DRAWING PENCIL OF THE MASTERS



Mr. Hesse, of the firm of Bloch & Hesse, New York, is one of the many prominent architects who was delighted with the news that CASTELL is again available in all its 18 incomparable degrees.

"CASTELL is the drawing pencil I missed most," declared Mr. Hesse. "I had used it consistently for many years—especially the degrees HB and 2B—and I am happy that it is again obtainable."

Mature Professional men know . . . but younger professional men are now having their first opportunity to use CASTELL, the tangible result of 187 years' cumulative pencil-making experience. CASTELL is again being milled according to the secret micrometric process of the House of A. W. Faber.

Bloch & Hesse are best known for their institutional buildings and for Schrafft Restaurants which they designed during the past decade. At present they are planning an $8,000,000 hospital for the City of New York.

Despite rising costs, ***CASTELL*** *is still being sold at the old pre-war price of 15¢ each . . . less in quantity . . .* **7B to 9H**

Order from your Dealer today.

AW FABER-CASTELL PENCIL COMPANY INC., NEWARK 4, N.J.

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You know that the faces of Roddiscraft Doors and Hardwood Plywood are smooth as satin — that edges are clean and true — but the quality that gives Roddiscraft Doors and Plywood long life and lasting beauty is an inside job. It's the inside materials — core blocks, glue, crossbandings, plus the care and craftsmanship used in fabrication that makes it possible for Roddis to unqualifiedly guarantee materials and workmanship.

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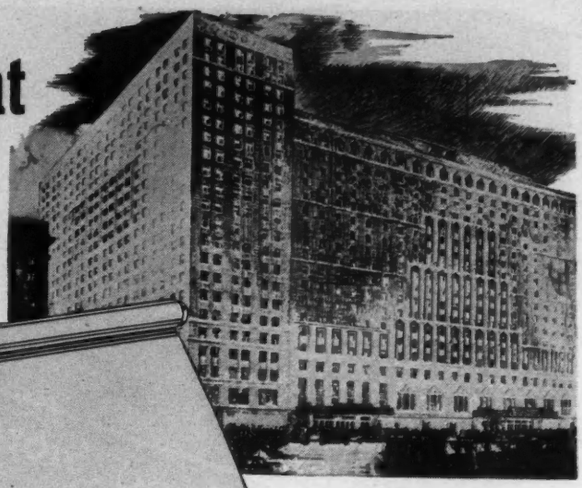
"...replacements amount to only 5% a year"



Mr. Otto K. Eitel,
Managing Director, says:

"'Tontine' shade cloth has been used exclusively in all our rooms for the last ten years. The average age of our present 'Tontine' shades is approximately five years and, due to their durability, replacements amount to only 5% a year...a small replacement schedule as compared with other materials in the past.

"We feel that we made a good choice in the use of 'Tontine' shade cloth, from the standpoint of both economy and durability."

Your clients will appreciate your recommending Du Pont's washable window shade cloth ... because it's the *economical* shade cloth. "Tontine"* is washable ... it resists fraying, cracking and pinholing. Comes in a variety of practical and decorative colors. Your client can arrange for an economical washing and repair service with his Du Pont "Tontine" dealer.

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looks better longer

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... THROUGH CHEMISTRY

"TONTINE" is Du Pont's registered trademark for its washable window shade cloth.

New Super Food Store Always Modern with WALKERDUCT

Joseph Margolis
Architect, Phila.

Joseph Sand
Engineer

Electric Constructors, Inc.
Millville, N. J.

A THOUSAND ELECTRICAL OUTLETS AVAILABLE IMMEDIATELY FOR ANY CHANGE IN STORE LAYOUT

Baltimore Markets, in planning their giant food store in Camden, New Jersey, realized the need for a flexible electrical system. WALKER, pioneer in the field of underfloor distribution, supplied the answer. "Locked-in" inserts provide outlets for power and light from concealed raceways running the length and breadth of the 30,000 square feet of floor space. Connections for light and power for any point on the floor at any time in the future may be quickly and cheaply made without disturbing the terrazzo floor. WALKER "Preset" method of underfloor distribution works just as well in office buildings, banks, factories, and schools.

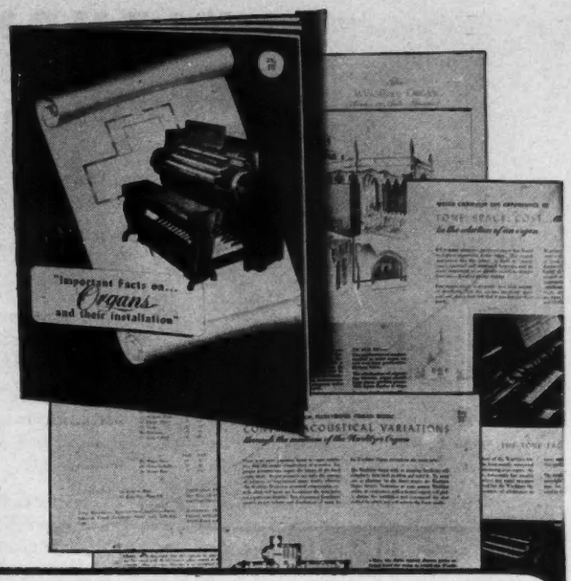
For further details, write for our Catalog #146 or consult Sweet's Architectural Files.

WALKER BROTHERS
Conshohocken 31, Pa.

walker of Conshohocken UNDERFLOOR SYSTEMS

When your plans include an

ORGAN INSTALLATION



You'll find this Reference Manual most helpful and informative. A copy is yours for the asking!

A 16-page brochure covering features you must look for in any organ you specify: organ nomenclature; American Guild of Organists' playing specifications; relationship of tone, space and cost; acoustics; pipe organ vs. electronic organ; essential and auxiliary equipment; installation requirements and techniques.

...study carefully these SPECIFICATIONS, then specify

THE WURLITZER ORGAN

Series 20 - Two Manual

● To you, as an architect, the selection and specification of an organ involve a serious responsibility, for true organ music must be traditional in tone. In the Wurlitzer Organ, with its two hundred years of musical heritage, you will find a superb electronic instrument that blends *authentically... traditionally...* the majesty of its many rich organ voices.

Compare the specifications of the Wurlitzer Organ in the panel at the right with those of any other electronic instrument. Then arrange for a demonstration and let your own ears decide. Simply mail the coupon for the name of your Wurlitzer dealer. He will be glad to demonstrate the Wurlitzer Organ for you. Also, we will send you a valuable reference manual, "Important Facts on Organs and Their Installation."

Remember, the Wurlitzer Organ can be *specified with utmost confidence* because it makes no compromise with quality or tone.

SPECIFICATIONS

MANUALS: Great and Swell Compass CC to C4, 5 octaves, 61 Notes.
PEDALS: Standard A.G.O. Concave Radiating, Compass CCC to G, 32 notes.

● The Series 20 Wurlitzer Organ has full electric action, natural walnut, hand-rubbed finish. It consists of two manuals and pedal clavier, and conforms to the recommended playing dimensions and standards of the American Guild of Organists.

CONSOLE DIMENSIONS: 48¼" high, 63⅓" wide. Depth with pedal clavier, 47"; without, 31½".

GREAT ORGAN

	Pitch	Notes
1. Bourdon	16′	49
2. Viola	16′	49
3. Open Diapason	8′	61
4. Flute	8′	61
5. Flauto Dolce	8′	61
6. Viola	8′	61
7. Dulciana	8′	61
8. Celeste	8′	49
9. Octave	4′	61
10. Flute	4′	61
11. Violina	4′	61
12. Twelfth	2⅔′	61
13. Fifteenth	2′	61
14. String Mixture	2 ranks	122
15. Chimes (Stop Tablet and Stop Tablet Switch only)		

SWELL ORGAN

	Pitch	Notes
16. Bourdon	16′	49
17. Stopped Flute	8′	61
18. Flauto Dolce	8′	61
19. Viola	8′	61
20. Dulciana	8′	61
21. Voix Celeste	8′	110
22. Stopped Flute	4′	61
23. Violina	4′	61
24. Flute Twelfth	2⅔′	61
25. Flautina	2′	61
26. Oboe	8′	122
27. Tremulant		

PEDAL ORGAN

28. Major Bass	16′	32
29. Dolce Gedeckt	16′	32
30. Octave Bass	8′	32
31. Diapason	8′	32
32. Violoncello	8′	32
33. Flute	4′	32

CONTROLS

34. Echo to Main
35. Echo On—Main Off

COMBINATION PISTONS: (Standard Equipment) Pistons Nos. 1-2-3-4-5, Actuating Stops in Great, Swell and Pedal Divisions (Under Great Manual).
PEDAL MOVEMENTS: Balanced Swell Expression Pedal. Balanced Grand Crescendo Pedal with Indicator Light.
ACCESSORIES: (Standard Equipment) Model 42 Tone Cabinet, with cable. Concave Radiating Pedal Clavier A.G.O. Bench with Music Compartment, Hinged Top.

THE RUDOLPH WURLITZER CO.
N. Tonawanda, N. Y., Dept. AR 3.

Gentlemen:

Please send me, without obligation, your 16-page Reference Manual . . . "Important Facts On Organs And Their Installation."

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Company_____

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City_____ Zone_____ State_____

The HARMON TECHNIQUE

brings a progressive new era in classroom interiors

Classroom modernization by the Harmon Technique produces dramatic results on school children.

For example: Ten months' educational progress was made in only six months . . . important reductions were recorded in eye and nutritional problems . . . and 30% less signs of chronic infection.

The Rosedale school, Austin, Texas, is a classic example of the Harmon Technique and here again the schoolroom walls and ceilings are painted with Luminall paint. Other factors in the Harmon Technique, aside from painting, are lighting, fenestration and seating.

Luminall paint is ideal for painting walls and ceilings in the Harmon Technique. It is highly light-reflective—up to 90.6% for white. It maintains this reflectivity because it does not "yellow" or discolor from age and exposure. It diffuses reflected light thoroughly. The colors are formulated to overcome chromatic aberration. It will do a brightness engineering job in evenly distributing light from whatever source it comes.

Ask for a copy of Dr. Harmon's "LIGHT ON GROWING CHILDREN," reprinted from Architectural Record. On receipt of sketches showing dimensions and details of schoolroom, specifications will be furnished according to the Harmon Technique without cost or obligation. NATIONAL CHEMICAL & MFG. CO., 3617 S. May Street, Chicago 9.

This Rosedale photo is *actually* a demonstration

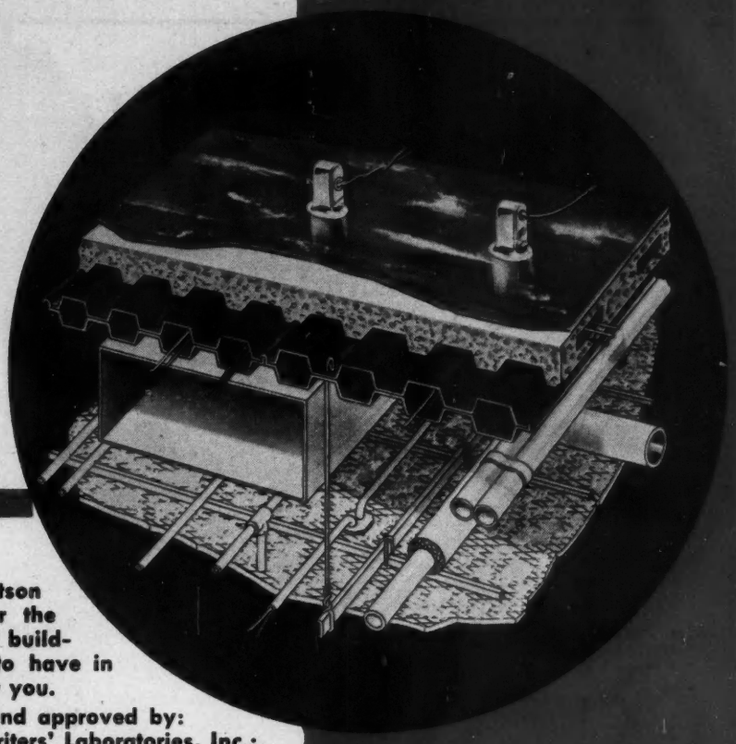
Here a photographic plate has been exposed rapidly enough to keep 21 youngsters from showing movement—indoors—and without the use of artificial light. Note the clear detail of book covers in rear . . . note clarity of detail under desks . . . note the remarkable evenness of light distribution . . . and notice also the erect easy posture and absence of tension in the children themselves. In such an environment, children can accomplish 10 months' educational progress in 6 months' time. Rosedale school is painted with Luminall.

LUMINALL

the light-reflective paint for interiors

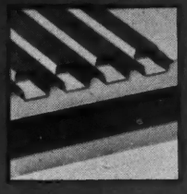
DATA

FOR FUTURE REFERENCE



Steel Q-Floors, made by H. H. Robertson Company, have been specified for the largest and most advanced postwar buildings. Here are the main features to have in mind when the subject comes up for you.

1. **Four-hour fire rating, tested and approved by: Bureau of Standards; Underwriters' Laboratories, Inc.; Mellon Institute of Industrial Research.**
2. **Structural properties verified in tests by: Bureau of Standards; Mellon Institute; University of Kentucky.**
3. **Approved for electrical raceway by: Underwriters' Laboratories, Inc., and covered by Article 356, National Electrical Code.**
4. **Over 6,000 installations—many millions of square feet and never a construction fire!**



Consider Construction Time

Completion time, not starting time, is what your client wants. Steel Q-Floors arrive pre-cut. Two men can lay 32 sq. ft. in 30 seconds. Construction is dry, so the Q-Floor immediately becomes a working platform for other trades.

So when estimating time of steel delivery be sure to figure on time lapse for demolition and excavation and then realize that Q-Floors reduce over-all construction time 20 to 30%.

Consider the Electrical Feature

The steel cells of Q-Floor are crossed by raceways for carrying wires of every electrical service. An electrician drills a small hole and can install an outlet in a matter of minutes. This means that all outlets and partitions can be established after occupancy. The headaches this eliminates only an architect fully appreciates. All floor plans are flexible forever, which keeps buildings young and greatly increases the earning power of rental space.

See Q-Floor Fittings at any General Electric construction materials distributor's. For details, please write.

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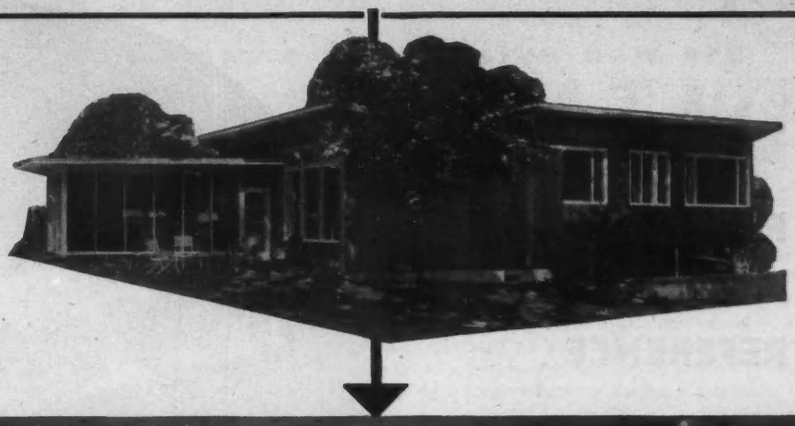
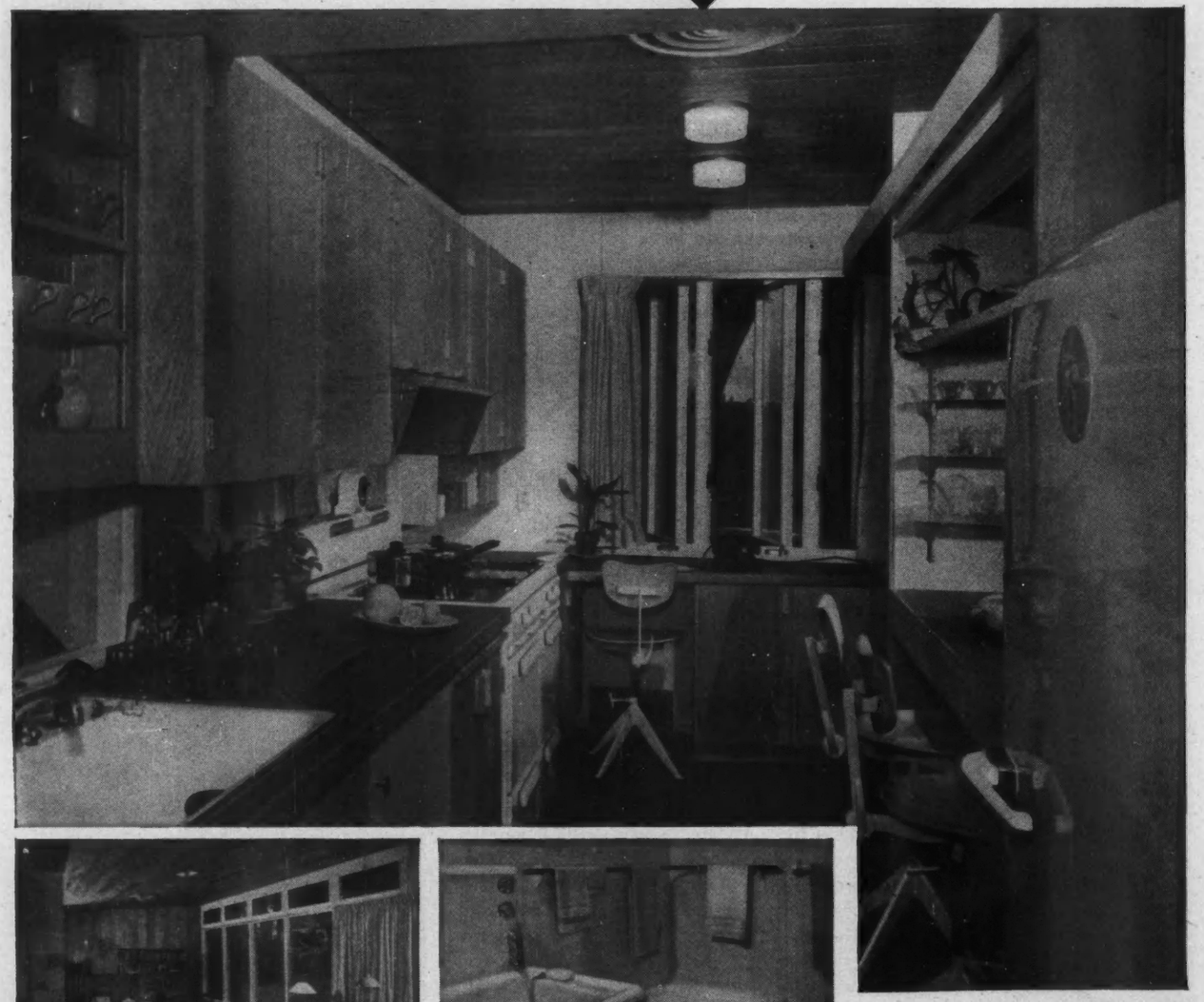
Pittsburgh 22, Pennsylvania

Offices in 50 Principal Cities
World-Wide Building Service

Wherever there's news in building



IDEA HOUSE #2, built by the Walker Art Center in Minneapolis to demonstrate the latest advances in home planning and equipment. Featured in the January issue of McCall's Magazine, the house incorporates split-level planning, solar orientation. One of its main attractions is the "New Freedom Gas Kitchen."



"NEW FREEDOM GAS KITCHEN,"* planned as part of the living area, features up-to-the-minute appliances in a casual, charming setting. Automatic Gas range built to "CP" standards makes light work of cooking; roomy Servel Gas refrigerator operates soundlessly, economically; automatic Gas water heater downstairs supplies abundant hot water.

*Cert. Mark Amer. Gas Assoc., Inc.

4-IN-1 LIVING AREA gives family of 4 plenty of room for work and play. Note built-in storage units, all-purpose table, "conversation" groups. Automatic Gas air conditioner keeps indoor weather perfect 12 months of the year.

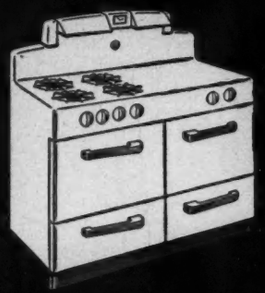
"PACKAGED" BATHROOM. Radically new, all-in-one prefabricated bathroom unit has swing-around washbowl, adjustable shower, handy cabinets. Trouble-free hot water service is supplied by an automatic Gas water heater.

...there's a

"NEW FREEDOM GAS KITCHEN"

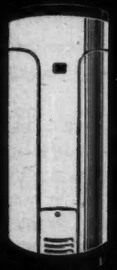
How you—the architect, the builder—can use this great new selling tool

Sweeping national advertising has sold all America on the "New Freedom Gas Kitchen." Buyers know them, want them. All you have to do is give them these kitchens — and you cash in on a tremendous, ready-and-waiting market! It's simple as ABC. For your kitchen qualifies as a "New Freedom Gas Kitchen" if it meets these simple requirements:

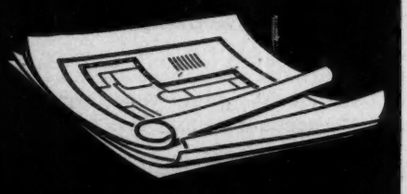


1. It must have a Gas range built to "CP" standards (Gas is America's favorite cooking fuel . . . it "feeds" 91,000,000 people daily)

2. It must have an automatic Gas refrigerator (Servel refrigerators stand in the tip-top ranks of America's most-wanted makes)



3. It must have an automatic quick-recovery Gas water heater (an absolute necessity for dishwashers and the new automatic laundries)



4. It must be well-planned and efficient (and you'll take care of that, anyway —aren't American kitchens the finest in the world?)

Hear what bankers . . . architects . . . builders . . . and buyers have to say about the "New Freedom Gas Kitchen" Program

THE BANKER SAYS: *"The house with a completely equipped Gas kitchen is a better financing risk . . . results in fewer delinquencies."*

• • •

THE ARCHITECT SAYS: *"I like the flexibility of planning with modern Gas appliances; the combination of mass appeal with individuality of design."*

• • •

THE BUILDER SAYS: *"A kitchen that's ready to live in, one that bears a 'stamp of approval'* everybody *knows, is a big help in selling a house."*

• • •

THE BUYER SAYS: *"A completely equipped kitchen saves us the delay and inconvenience of installation. Our kitchen will* stay *modern, will give our house a higher re-sale value."*

Free: Complete promotional material to help you tie in with this great program. See your local Gas Company or write

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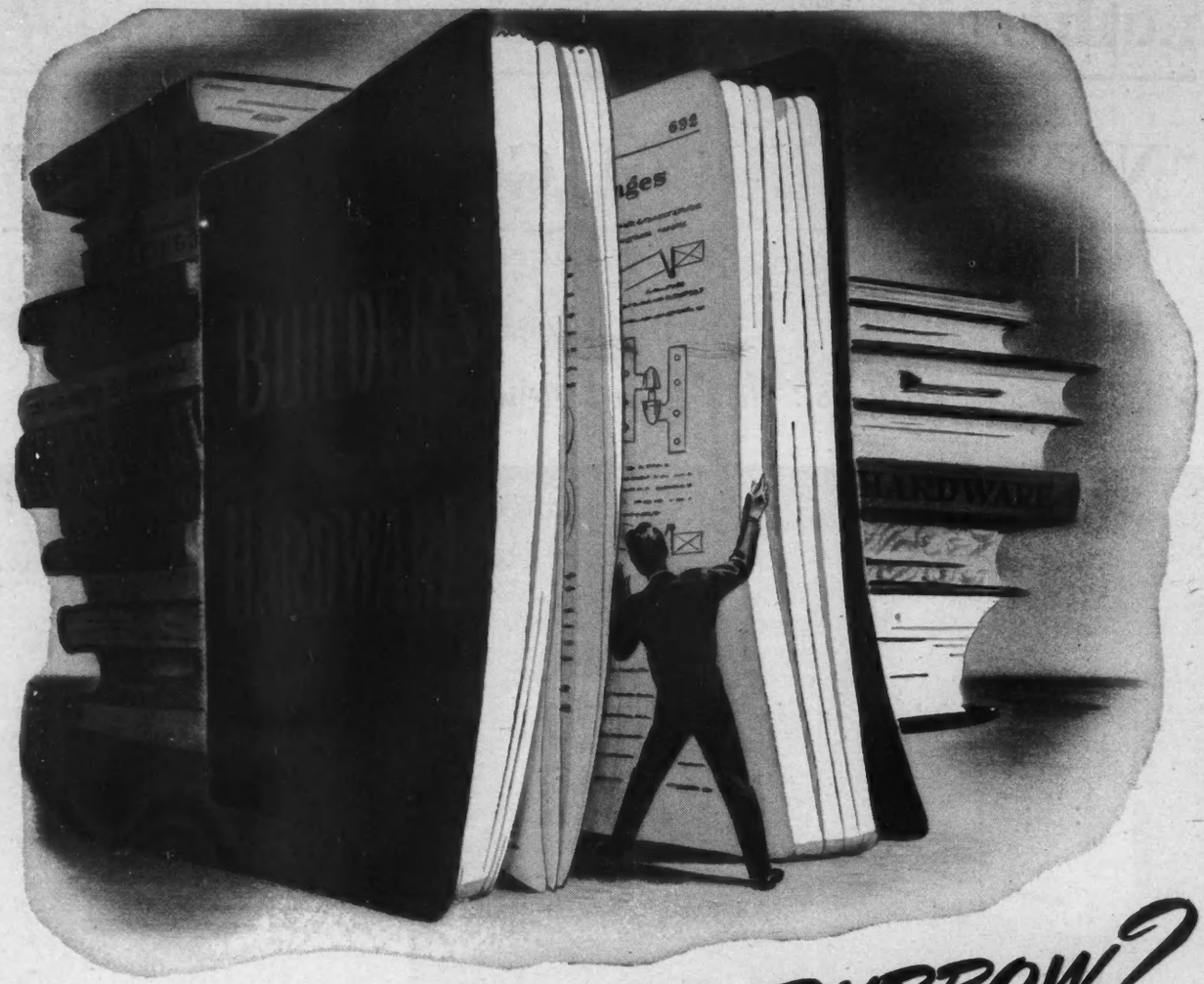

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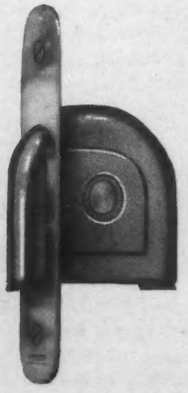
If you do not know the hardware consultant in your area, a letter to Stanley will put you in touch with him promptly.



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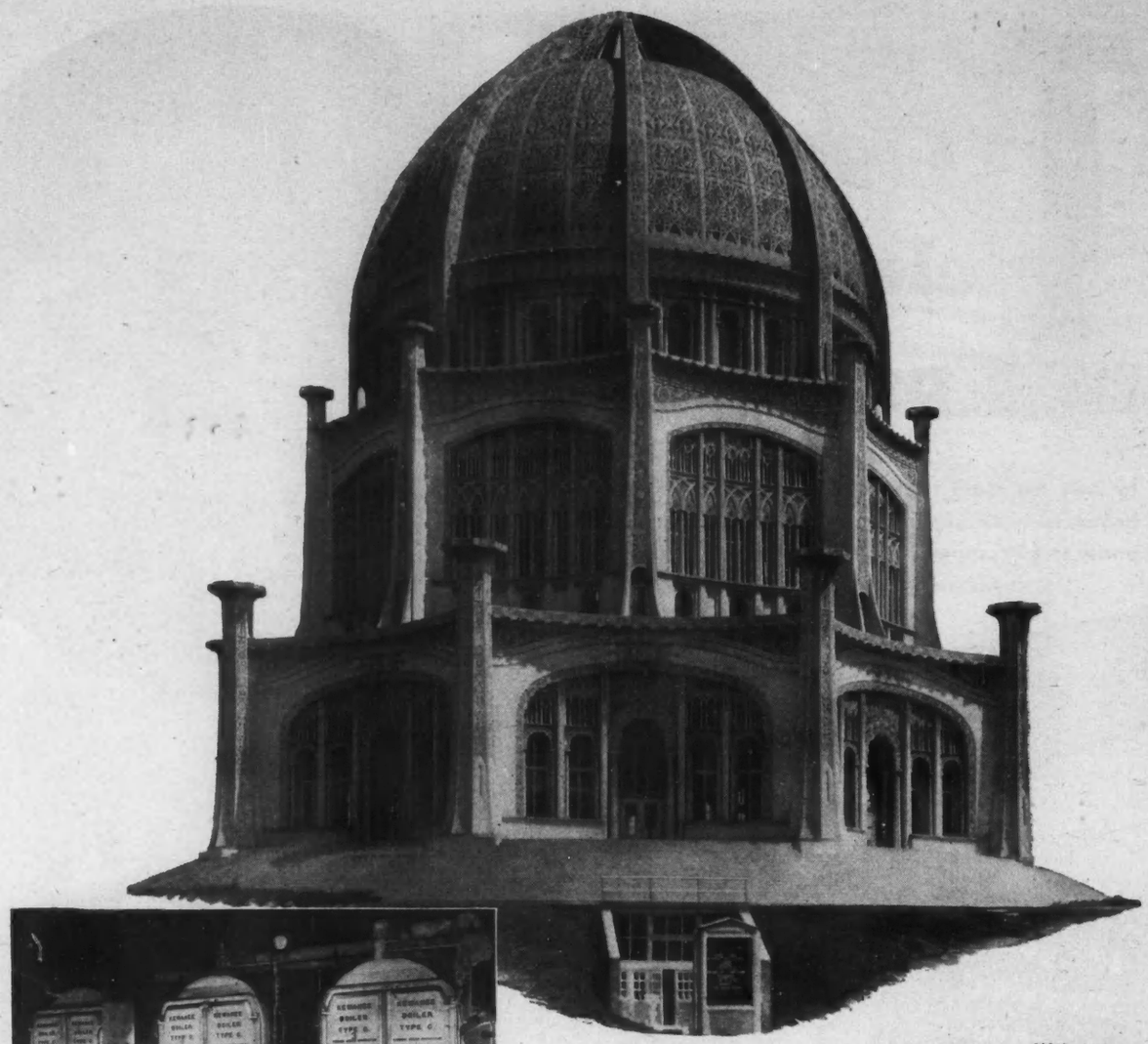

The BAHÁ'Í TEMPLE Wilmette Illinois

Nonagon in plan, tripartite in elevation, this architectural masterpiece blends the ancient mysticism of the Orient and of the Occident with the practicality of the present. It was laboriously molded block by block in gleaming white cement sparkled with fine-ground quartz.

Three tiers of nine capital-tipped pilasters support as many arched facades for the doorways inset below. All are richly fashioned in symbolic tracery. All converge triumphantly to a focal pivot-point, fit apex for the capping cupola, spheroid shaped and textured in frosted filigree.

In perspective a brilliant vista, this house of meditation is the visible nucleus of a cultural center to come, purposed as a social service grouping to exemplify in practice the unifying influence of Baha'i teachings.

Baha'i's boilers offer three-fold warmth in welded steel from a triad of

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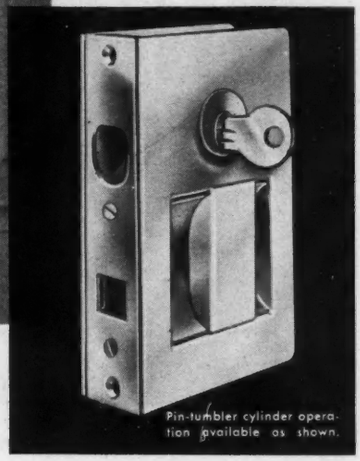

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This Quality Lock *Adjusts* to fit $1\frac{1}{8}$"-$1\frac{15}{16}$" Sliding Doors

Here is today's newest and most modern sliding door lock. Every desirable feature has been included in this Rite-Lock—enduring quality, fine appearance, compact size, positive action and extra-speedy installation.

This new Rite-Lock releases with a natural sliding action of the bar in the cup. The simple latching mechanism, made of rust-proofed steel. insures trouble-free operation for the life of the door. A finger pull is formed in the face plate, eliminating the necessity for other edge pulls. Rite-Lock has been designed by experts of nearly 50 years standing in the lock industry!

The Rite-Lock is of unit-type—installed by notching stile—no mortise is necessary. Size of outer case is $4\frac{1}{2}$" x $2\frac{7}{8}$"—adjustable in width from $1\frac{1}{8}$" to $1\frac{15}{16}$". All exposed parts are solid brass, with various finishes available singly or in combinations. Each lock is adaptable to doors of either hand with dead-lock either side having an emergency unlocking feature opposite. (A $\frac{3}{4}$" diam. pin tumbler cylinder operation in the escutcheon is optional at slight additional cost—master-keying if required.) This is a lock worth knowing about...for further details see your local Hardware Consultant or write direct.

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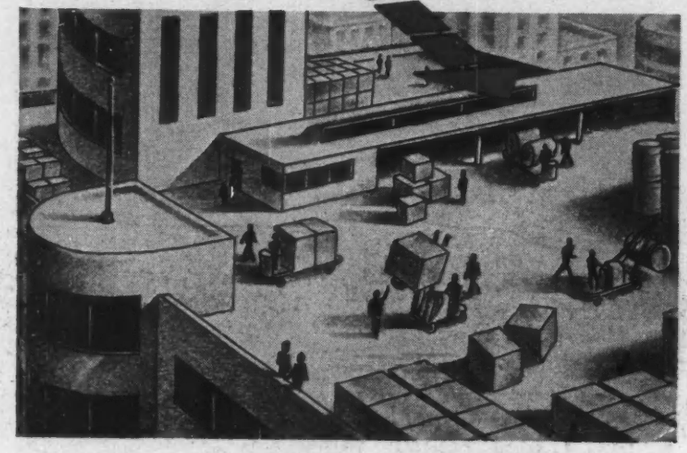
PHOTO BY FAIRCHILD AERIAL SURVEYS



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ROOFS LIKE THIS are typical of the modern, functional utilization of an area that formerly went to waste. The factory roof illustrated here has a husky concrete surface for heavy traffic and storage. Other related possibilities are hospitals with outdoor decks for convalescents, apartment houses with gardened roofs, department stores with recreational roofs for employees.

These are "roofs of the future," but recently evolved Ruberoid specifications make them completely possible *today!* As worked out by Ruberoid engineers, these new roofs are not impractical dreams, but thoroughly tested, down-to-earth certainties! Full details of these and other developments are available from the Ruberoid Company or from your local Ruberoid Approved Roofer. Call on your Ruberoid Roofer for help in the solution of any roof problem. His "know-how" is backed by Ruberoid's years of experience and complete line of all types of roofing materials!

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ARCHITECTURAL

RECORD

"THE ARCHITECT'S COMPANION"

By pure coincidence I have on my desk at the moment two little volumes. In one, there appears in part on its title page "*The Country Builder's* ESTIMATOR: *or the Architect's Companion, for Eſtimating of New Buildings or Repairing of Old; In a conciſe eaſy Method, intirely* NEW . . . WHEREIN *The ſeveral Artificers Works concerned in Building and every Article belonging to each of them are fully, diſtinctly, and ſeparately conſidered; and the* PRICES *thereof inſerted, not only of the Workmanſhip but of the Materials alſo, and what Quantity of Materials are required to the Performance thereof . . . By William Salmon, Jun. Printed for* JAMES HODGES, *at the Looking-Glaſs on London-Bridge, 1737.*" And in which a portion of the preface reads ". . . *I hope this ſmall Treatiſe will be a Means of promoting diſtributive Juſtice to all Men, in ſuch Things as relate to a* BUILDING, *whereby both Maſters and Workmen ſhall have what is right and equitable between them; and as well prevent Gentlemen from being imposed upon by fraudulent crafty Workmen, as ignorant Workmen from taking their Work at too low a Price, which oftentimes proves of dangerous Conſequence to them; (viz. the Ruin of themſelves and their Families,)* . . ."

The other volume is the February issue of the Journal of the A.I.A., in which is ably set forth by R. D. Sannit, the why's, wherefore's, and how's of providing accurate quantity surveys, albeit putting full responsibility for the accuracy of the "guaranteed survey" on the already stooped shoulders of the architect. His article is entitled "We Can Cut Building Costs."

The Architect's Companion, neglected these many years, with its hand-cut type on hand-made paper, describing handcraft methods (and listing "bricks per thousand at 20 shillings; lime per bushel fr. 5d to 6d; thatching-lath, per bundle — 1s.6d .") has long since ceased to be anything but a quaint curiosity, except as a reminder that perhaps it is time for the architect today to seek a successor companion, in the same pious hope as that expressed by William Salmon, Jun., some two hundred years ago. And a reminder, too, that costs are, have been, and will be, a thorny problem to the architect.

With high costs plaguing us it would seem that it would be well to have a companion to provide a more efficient means for determining costs because of the saving in time and money that should accrue to the architect, contractor, and the owner. Our usual present-day practice is obviously wasteful and accurate data on current costs is woefully lacking. Perhaps the needed companion is the expert, trained Quantity Surveyor as consultant to the architect, as Mr. Sannit proposes.

While the accurate determination of current prices would be desirable, it is still more important to have a knowledge of *comparative* costs of materials and systems of assembly. And not only first costs are to be considered but the relative functional efficiencies, and the costs of operation, maintenance and repair. Only with such facts can an intelligent choice of materials and assemblies be made in designing to provide the requisite facilities within a specified budget. While no one would expect a quantity survey system to bring about major reduction in the cost of building, the expected increase in efficiency indicated makes the proposal worthy of careful and immediate study. So, will those who are looking for just this sort of Architect's Companion please raise their hands — and their voices?

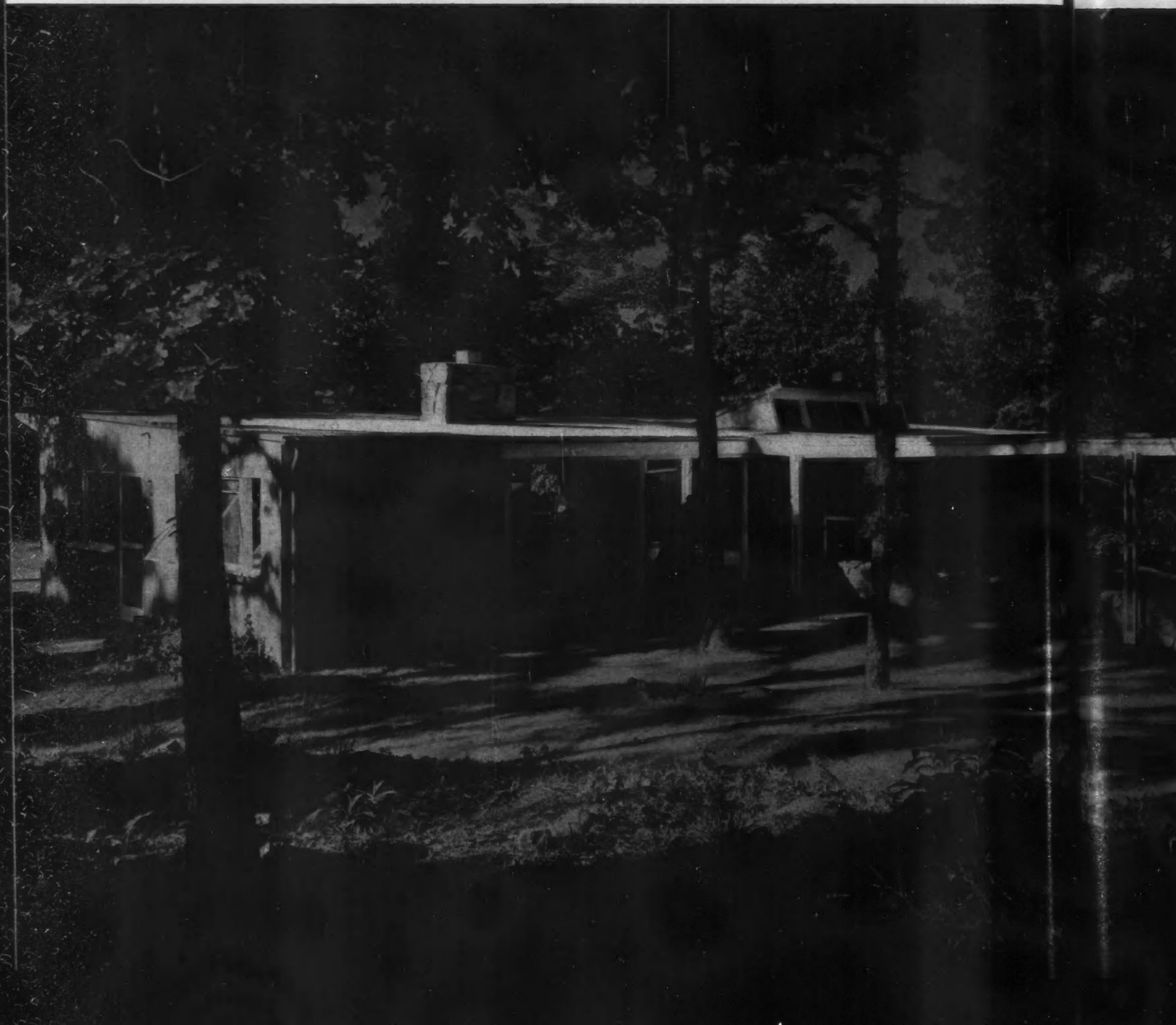
Kenneth K. Stowell

EDITOR

AN ARCHITECT'S HOUSE IN

HUGH STUBBINS, JR., ARCHITECT

Entrance side. Left to right: kitchen, social rooms, clerestory light over bathrooms, children's wing (toward rear); passage, garage



IN MASSACHUSETTS

Ezra Stoller Photos

THE way this house serves plain, hearty American family life, without reaching for tricks and effects, is, we believe, the important contribution in its very straightforward and brilliantly sensible scheme.

The house conspicuously avoids a certain kind of contemporary design ostentation, a kind that manifests itself not in colonnades, urns, or broken pediments, but in elaborate "zoning" separations, broken masses, fancy materials, and tricky detailing.

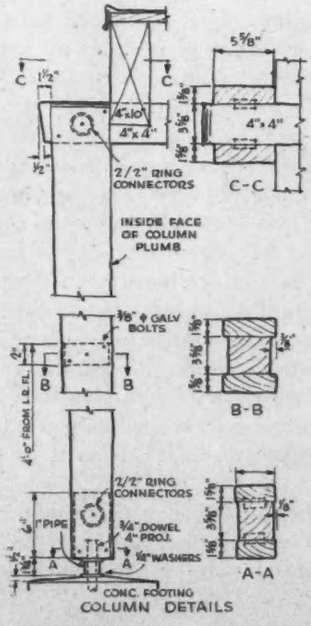
The surroundings were mostly found not made; like the pioneer cabin the house is a ship-shape dwelling set in a "clearing." Here young Hughdie, aged eight, can have the American boy's traditional privilege of growing up among trees, rocks, slopes, fields. For an architect's family of five, this had to be done economically and simply.

Though the first impact is of a charming family setting and not a diagram, the plan (overleaf) shows a quite consummate "zonal" arrangement, all within a simple rectangle of a house, set among natural terraces. At the center, like a control room, is the parents' bedroom. The left, or social, wing is based perhaps less on the four-square living-dining room than on the family kitchen, convenient alike to interior and exterior living. The right wing gives the children their own four-square living and play area, isolated from adults. Underneath, again separately accessible, is the father's architectural office. (The superhighway from which the trees shield the house gets him in twenty minutes to his other work at Harvard in the Graduate School of Design.)

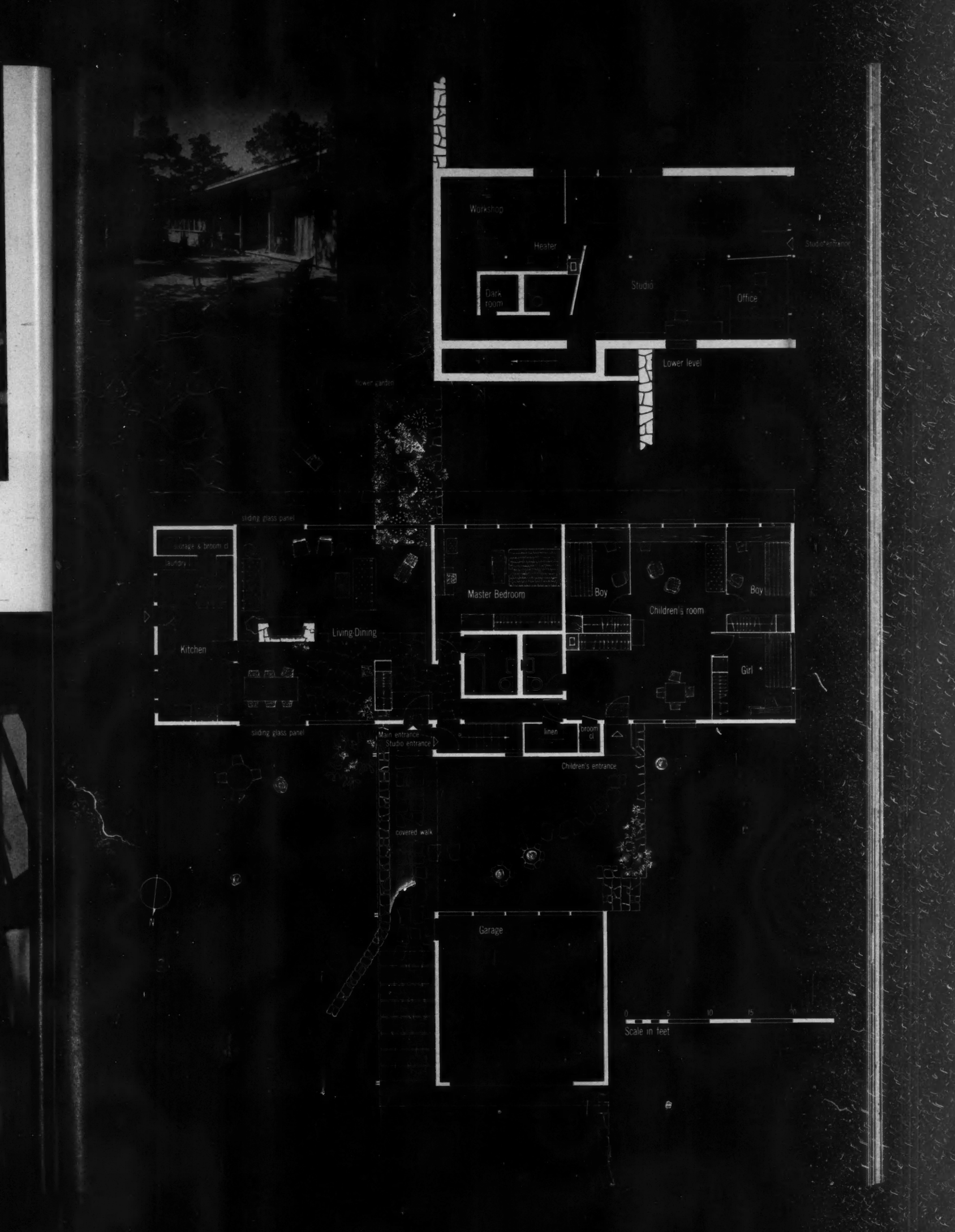
Using plain materials, straightforward construction, uncomplicated plans, the architect built his house in 1946–7 at $8.50 a square foot, and financed it all through conventional lending agencies.

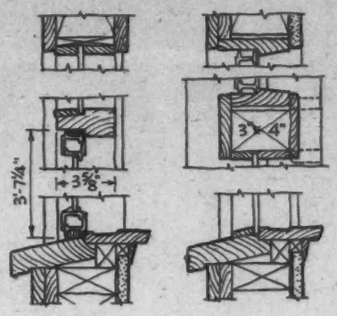
South view, on "solar" side, shows how ground drops to permit lower-floor office of cement block protected by cantilevering

Covered walk from garage to house (view at right) visually intersects the rectangular house. Vista ends in Mrs. Stubbins' garden, which in turn invades the house (see color illustration on our cover). Stone fence and retaining walls (of clean-cleaving local fieldstone) tie house to ground, afford four living terraces

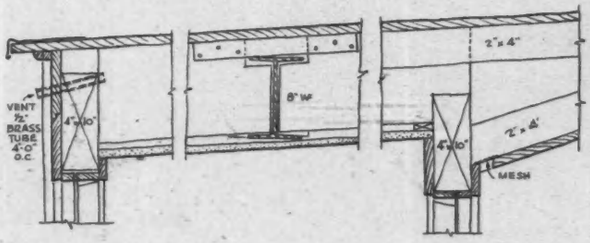


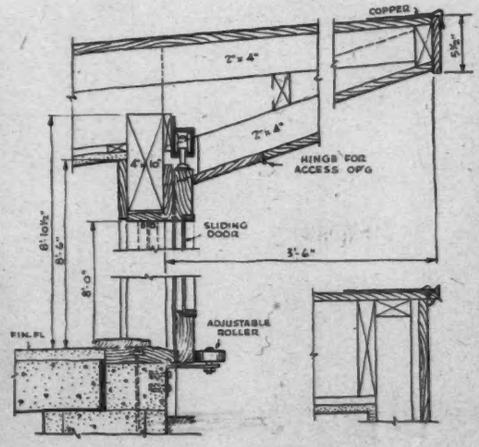
COLUMN DETAILS


Workshop
Heater
Dark room
Studio
Office
Studio entrance
Lower level
flower garden
sliding glass panel
storage & broom cl
laundry
Kitchen
Living-Dining
Master Bedroom
Boy
Children's room
Boy
Girl
sliding glass panel
Main entrance
Studio entrance
linen
broom cl
Children's entrance
covered walk
Garage
N
0 5 10 15 20
Scale in feet

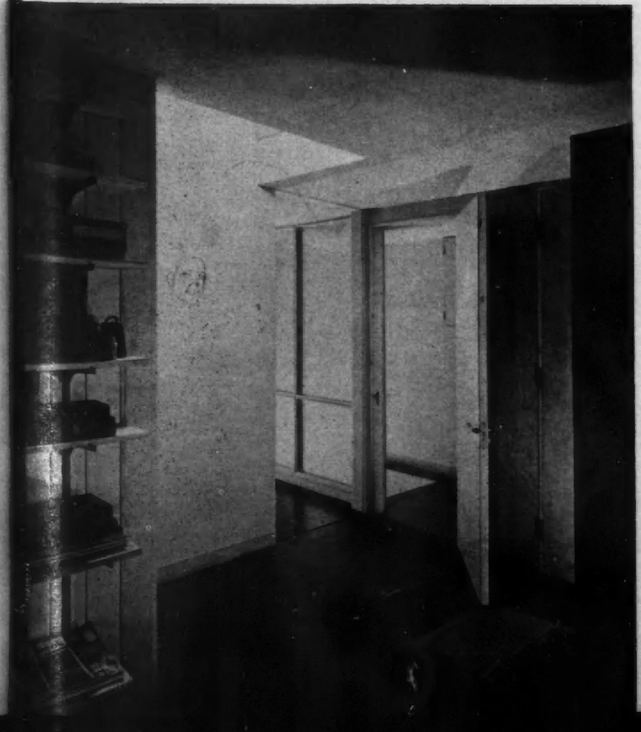


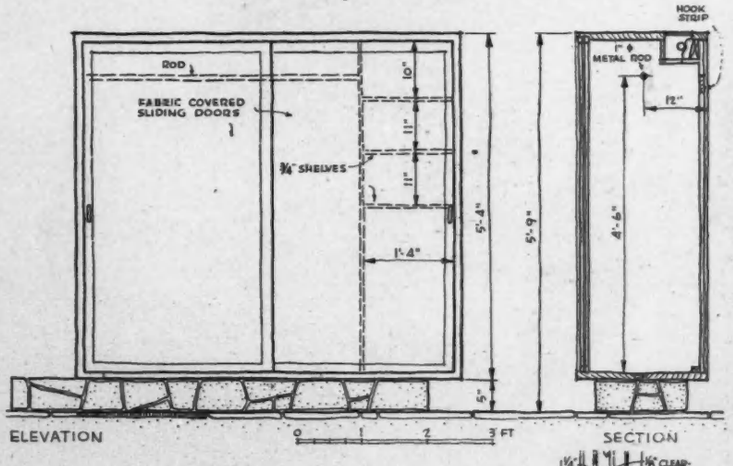
Living room view at right lets us see Mr. and Mrs. Stubbins and daughter Patricia before the ample fieldstone fireplace. The large sliding glass door, or panel, which opens the large square room to the out-of-doors, has its square frame painted Chinese red, which stands out strongly against the light gray vertical beveled pine boards, the varnished soffit, the white facia and trim. (Detail at bottom of page.) The fishnet curtain (see also our cover) is supplemented when desired by heavier drapes. Other openings are fixed glass or steel projected sash. Details shown are typical; the architect believes that mastery is shown in reduction, not multiplication, of details

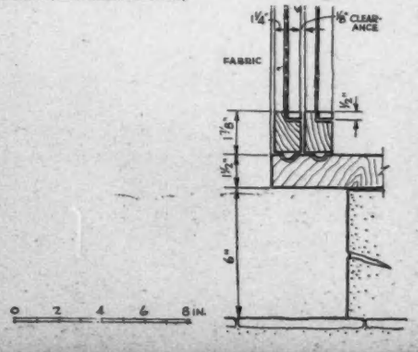




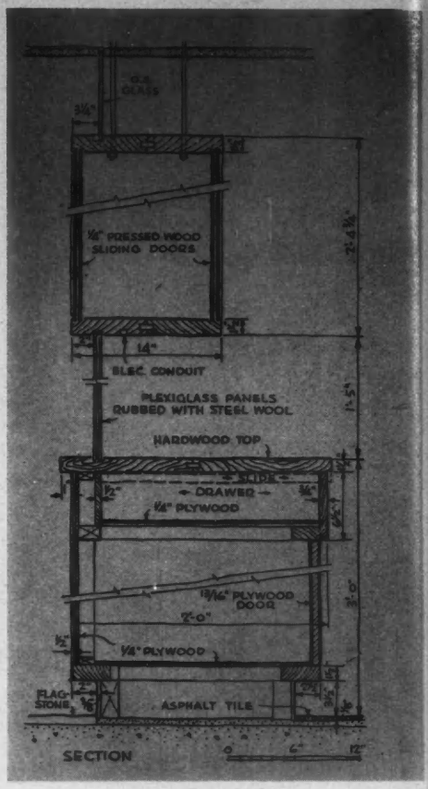
Above, detail of sliding glass panel (reduplicated on opposite side of room). Garden (left) carries into room (see our cover)



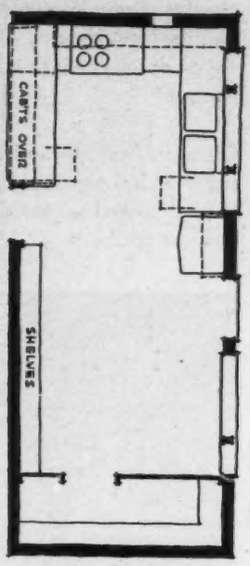




Wardrobe details are of free-standing cupboard by entry (right edge of photo). Face on wall is Calder mobile of twisted wire



Pass-through cabinet creates division between kitchen and dining room, which is separated in turn from living area by fireplace wall, from entry by coat closet. Glass and china cabinet, suspended from ceiling, has pressed-wood sliding doors opening both ways. Pass-through panels are Plexiglas rubbed with steel wool; counter is teakwood, which also serves as bread board and cutting surface. Marble counter, to right of electric range, is heat-resistant, serves as pastry board. Dining room floor is gray slate rubbed with hot wax. Large square sliding glass panel, opening dining room to terrace, balances similar panel in the living room, as seen on previous page

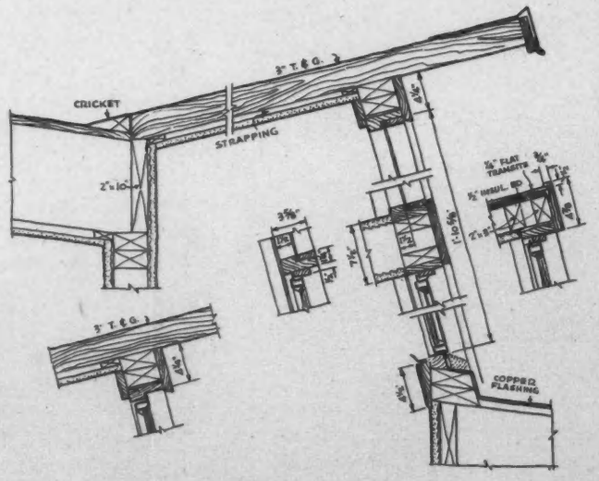


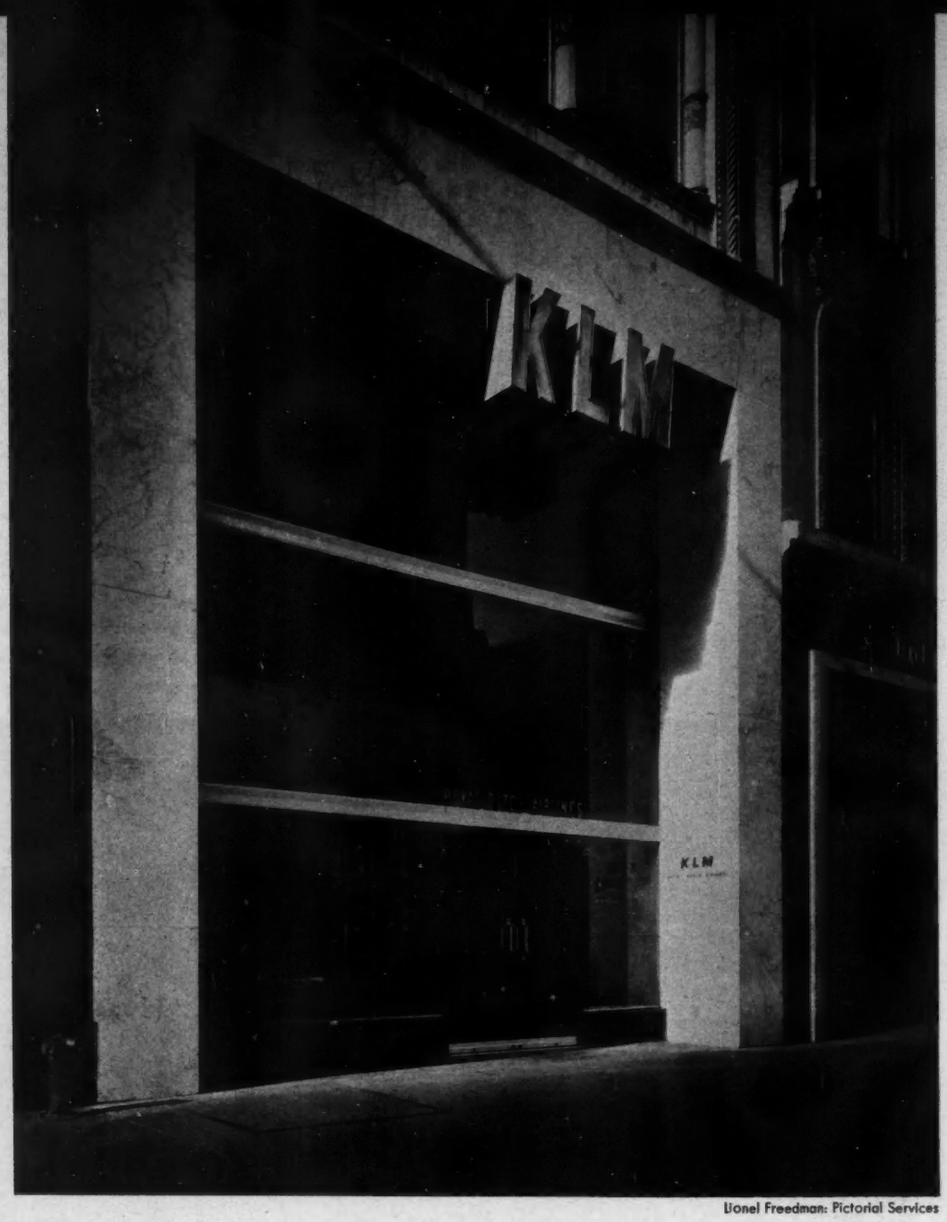
Lower half of kitchen is laundry and storage cabinet

Children's recreation room, right. Partition walls of vertical sugar pine were installed after floors and ceiling had been finished, so as to permit easy rearrangement whenever family requirements may change. Furniture, such as chair in foreground, was designed by the architect for domestic use

Master bedroom has built-in closets of detail similar to coat closet (page 93) with fluorescent lighting to illuminate both closet and room in general. Furniture, below, combines make-up table, desk, radio (mirror above produces illusion of through passage)

Clerestory light over bathrooms (bottom of page) is brought down close over roof, but has caused no leaks as yet through snow accumulation





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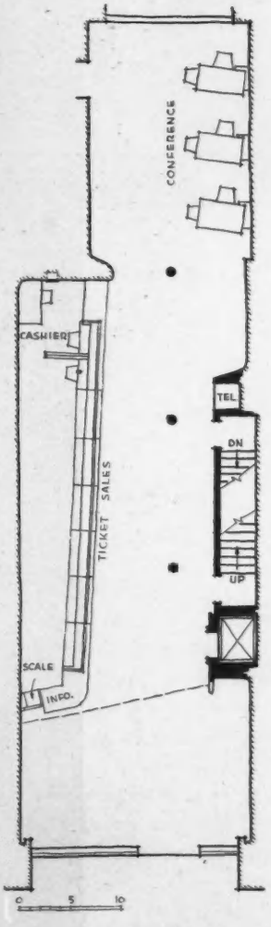
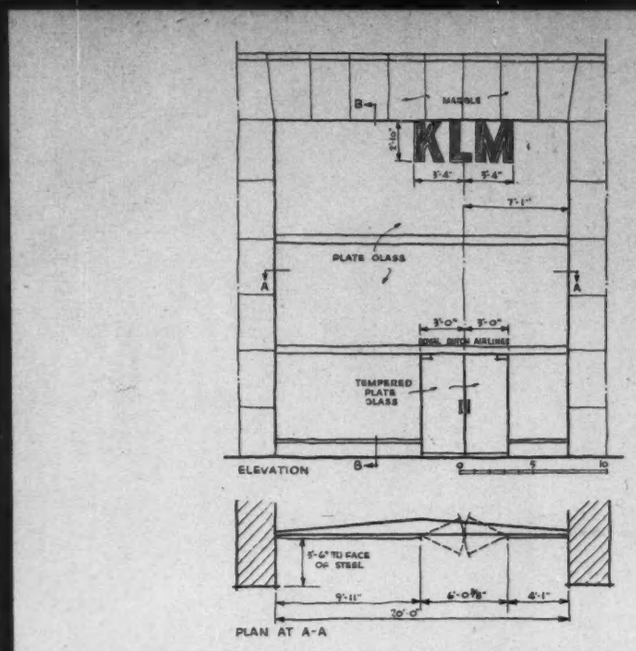
Louis Shulman

Designer



ROYAL DUTCH AIRLINE OFFICES

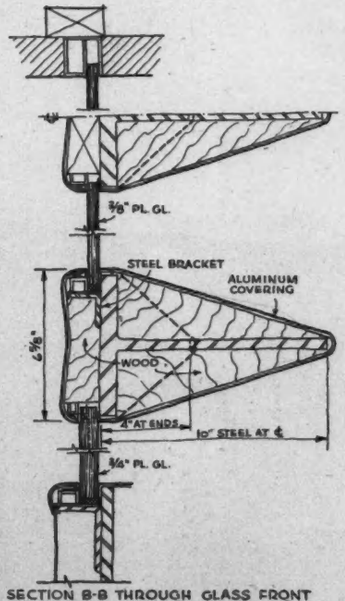
FIFTH Avenue's most striking new front marks the headquarters of "the oldest operating airline in the world," the Royal Dutch Airlines, in Dutch, Koninkluke Luchtvaart Matschappi. The first floor is devoted to serving the public with its information, ticket sales, and flight conference facilities. The upper floors are devoted to the general offices of the company in this country. The second floor, or mezzanine, extends almost to the front, but the feeling of spaciousness is retained by the ingenious and effective system of lighting, for the whole ceiling under the mezzanine is brilliantly illuminated. Curving the front of this mezzanine raises its visual lines and increases the apparent ceiling height of the first floor. An elaborate conveyor system connects the six ticket sales stations and the cashier's department to eliminate travel between the counters and the cashier. Pneumatic tubes connect the main floor with the offices above. Ceilings are white, the side walls gray and blue, and columns are covered with red leather. The floor is of gray rubber tile. White marble enframes the expanse of plate glass.



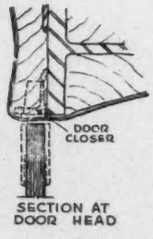
Lef.: Lionel Freedman: Pictorial Services. Below: Ben Schnall Photo

Much of the striking effect of the design was due to the simple, uninterrupted width of the plate glass panels. The upper lights, approximately 20 by 7 ft., each, are of ⅜-in. glass, about the largest plate glass made in that thickness. The lower panel is of ¾-in. plate glass and the doors are of herculite of the same thickness, hung on self-closing door hinges to eliminate the necessity for a frame which would interrupt the wide expanse

Lionel Freedman: Pictorial Services



SECTION B-B THROUGH GLASS FRONT

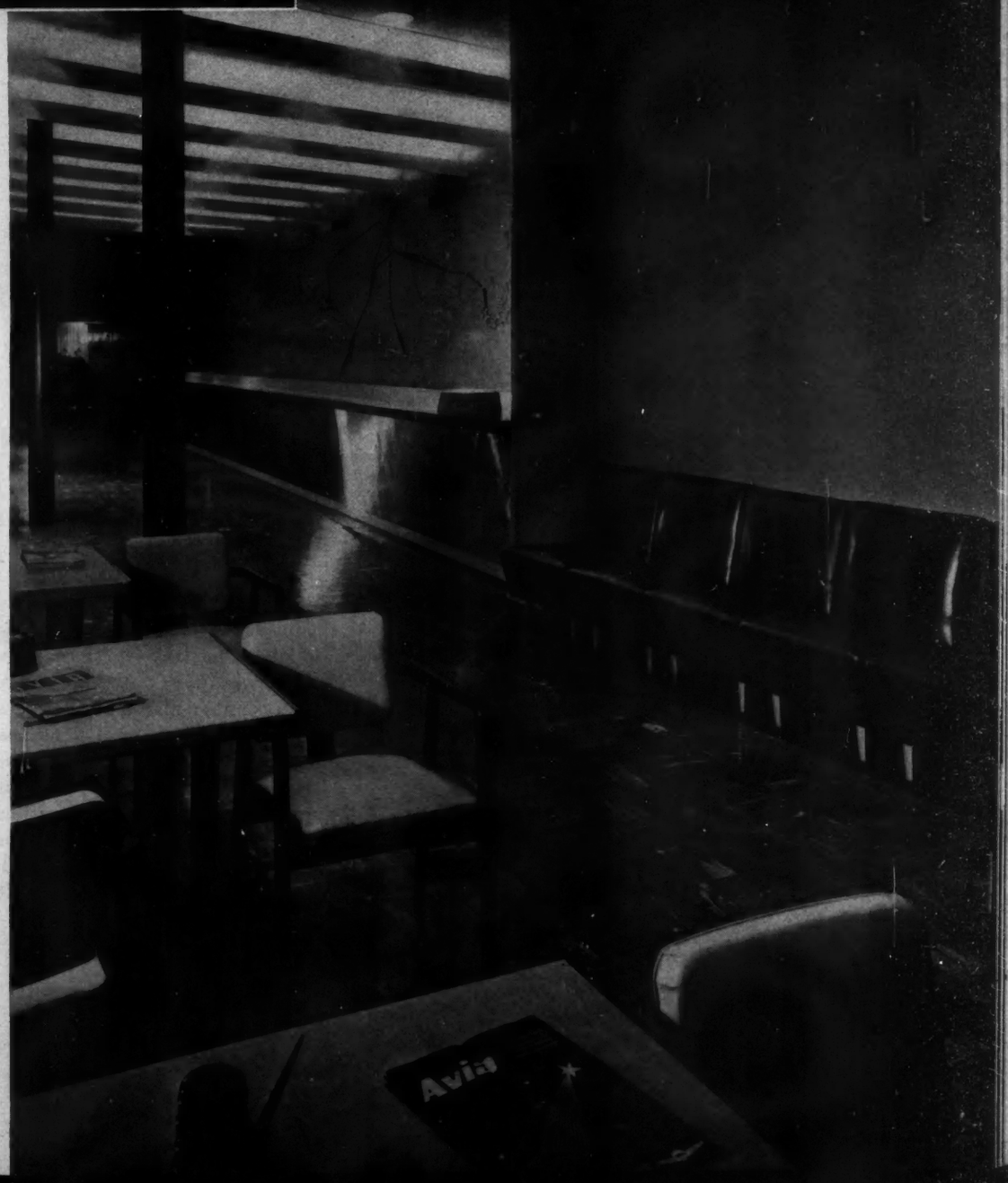


SECTION AT DOOR HEAD

The two horizontal structural members are tapered toward the ends, a structural form designed by Peter Bruder, engineer, to take care of any possible wind stresses. When these were designed, steel and wood were covered with aluminum as aluminum T-shapes were not then available. The form is similar to a great, narrow airplane wing, an especially appropriate form for an airline office. The glass is set flush with the marble so there is practically no metal frame or molding between the glass and its marble enframement. A low bulkhead is interrupted by the glass doors and indicates their purpose as well as providing the necessary space for heating

The ceiling above the public and counter space gains its appearance of lightness from the serrations which provide for brilliant but glare-free illumination. From the front no light sources are visible and the wall-to-wall lines of double 25 mm cold cathode tubes are shielded by translucent glass. Cold cathode lighting was selected both for the quality of light and longevity of tubes. Other lighting from flat parts of the ceiling are recessed to prevent any possible glare. The front surfacing of the ticket counter is of stainless steel faced plywood

Left: Lionel Freedman Photo. Below and opposite page: Ben Schnall Photos



Curved, upholstered banquettes are comfortable and conveniently placed under the mezzanine away from the main traffic. Recessed "shadow-boxes" provide light as well as settings for decorative flower arrangements

British Overseas Airways Corporation Offices, New York City

Wm. F. Howland Photo

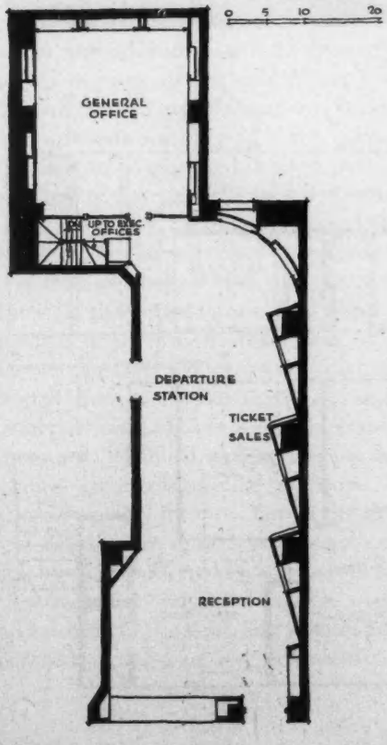
BRITAIN CIRCLES THE GLOBE

Pamela C. Colgate, Designer

Alfred Cook Photo

As one might expect, the B.O.A.C. has arranged an efficient, dignified and comfortable headquarters to care for the transactions of air travelers' business with the least possible confusion or delay. Facilities are where one would expect to find them, counters placed at angles for greater visibility, no elements distracting from the business at hand, yet comfortable seats and convenient tables avoid any appearance of rush. The indirect lighting panel is supplemented by down-lighting spots and the murals are illuminated by louvered panels that shield the eyes from any possible glare. Executive offices are on the mezzanine behind the panel of corrugated glass above the clocks showing simultaneous time at New York and London.

From the street an attractive, full view is had of all the public space



Wm. F. Howland Photos

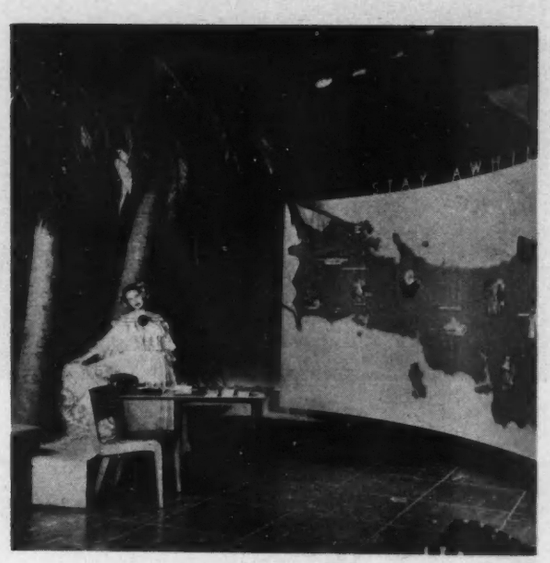
Richard Garrison Photos

VISUALIZING THE TROPICS

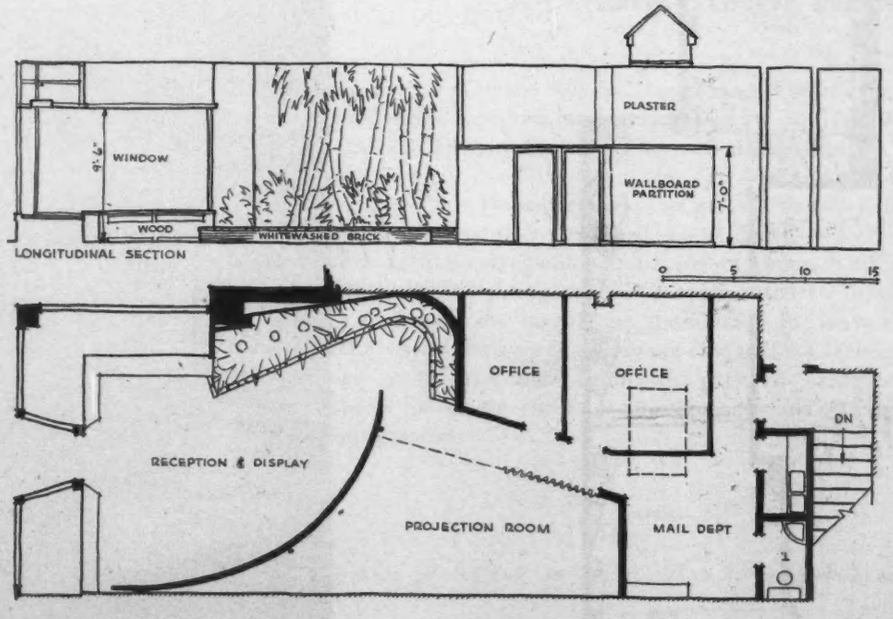
Beeston, Stott, Patterson, Designers

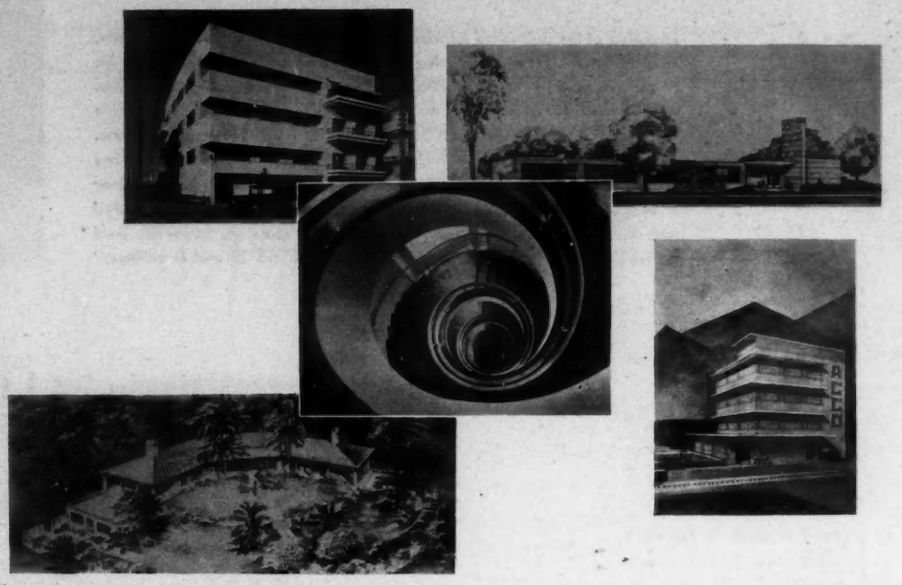
Office of the Panama National Tourist Commission
New York City

In a limited space, Panama is effectively dramatized and made alluring, an exotic tropical atmosphere is created, and provision is made for pre-vision of the delights of the country through moving pictures. And there is still room for the necessary offices and the mail department. The decorative mural map with its bas-relief accents separates the reception and display space from the unadorned projection room, and the waving palms complete the tropical setting.



Plan, section, and view of projection room show the efficient simplicity of the arrangements for inviting prospective travelers to "stay awhile in Panama"





A THOUSAND WOMEN IN ARCHITECTURE

A survey of the women in the United States who have been trained in architecture, and a presentation of the work of some of the most outstanding among them:

PART I

How many women architects are there in the United States? When the editors of the ARCHITECTURAL RECORD were asked that question some months ago they had not the faintest idea of what the answer might be, but they volunteered to find out. With the cooperation of the national Women's Architectural Association (Alpha Alpha Gamma) and the deans of the architectural schools throughout the country, a list of 1119 women who had studied architecture was compiled. A questionnaire was sent out to each of the 1119.

As was to be expected, a good part of the list proved to be out of date, and 87 of the questionnaires were returned unopened. Of the remaining 1032 women, a total of 231 so far have replied — roughly 22 per cent. Of these, 108, or about 47 per cent, are actually practicing. Many of them have their own firms; 32 of them are members of the American Institute of Architects. Some idea of the high type of work they are doing can be gleaned from the following pages and from the additional portfolios of their work which the ARCHITECTURAL RECORD will publish within the next few months.

Since architecture, like medicine and law, is traditionally a field for men, two of the questions the ladies were asked were aimed at ascertaining the difficulties they have encountered because of their sex. While quite a few reported occasional trouble with the contractors and laborers in the field, and several admitted to having been taken more or less frequently as secretaries in their own offices, not a single one indicated any disappointment whatever in her chosen career. Logically enough, most of them stress residential work as the easiest to obtain and, on the whole, the most satisfying and natural for women to engage in. And a good many comment on the sad truth that in architecture as in every other field women are paid considerably less than their male counterparts.

As for the women who, though trained in architecture, are not now practicing, the vast majority are "busy raising little architects." Many of them hope to get back into the field once their children are of school age. And even in their temporary retirement many of them are putting their training to use in the design of homes for themselves and their friends.

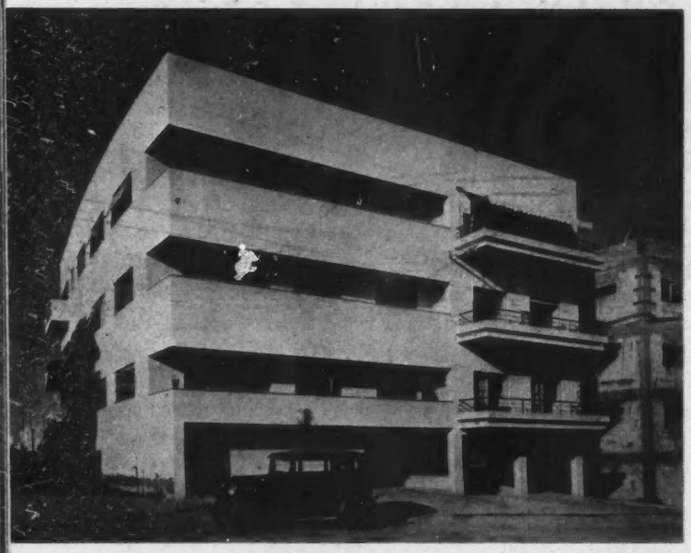
The 10 women whose work is shown in the following pages were chosen somewhat at random. They represent every section of the country, and almost every existing type of building design. Two of them were educated abroad, five have their own offices, two are in partnership with their husbands, and seven are successfully combining marriage and a career. Taken as a group, these 10 are probably typical of their *consoeurs* throughout the profession. They like their work and they have made good at it. Not a one of them would give up her practice if she possibly could help it. These 10 are architects; it so happens they also are women.

ELSA GIDONI, A.I.A.

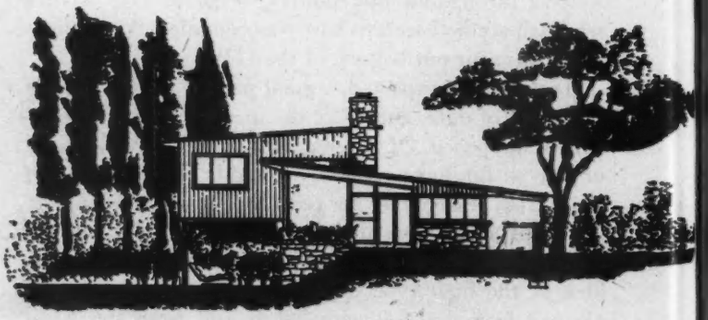
New York, N.Y.

Educated at the Petrograd Academy of Art and Berlin Technical University, Elsa Gidoni has earned her living at the drafting board since she was 16. From 1929 to 1933 she was affiliated with several noted architects in Berlin. In 1933 she went to Palestine, where for five years she had her own office and designed many of the buildings in Tel-Aviv, including those shown below. While there she won several important architectural competitions. She has been in the United States since 1938, spending the war years with Fellheimer & Wagner designing chemical engineering buildings. She is now associated with Kahn & Jacobs, New York. Of architecture she says, "It's a fine field for women, but it's not what you think when you are 18 and in college!"

Right and below: apartment houses in Tel-Aviv



Below: cafe-restaurant on the Mediterranean shore, Tel-Aviv

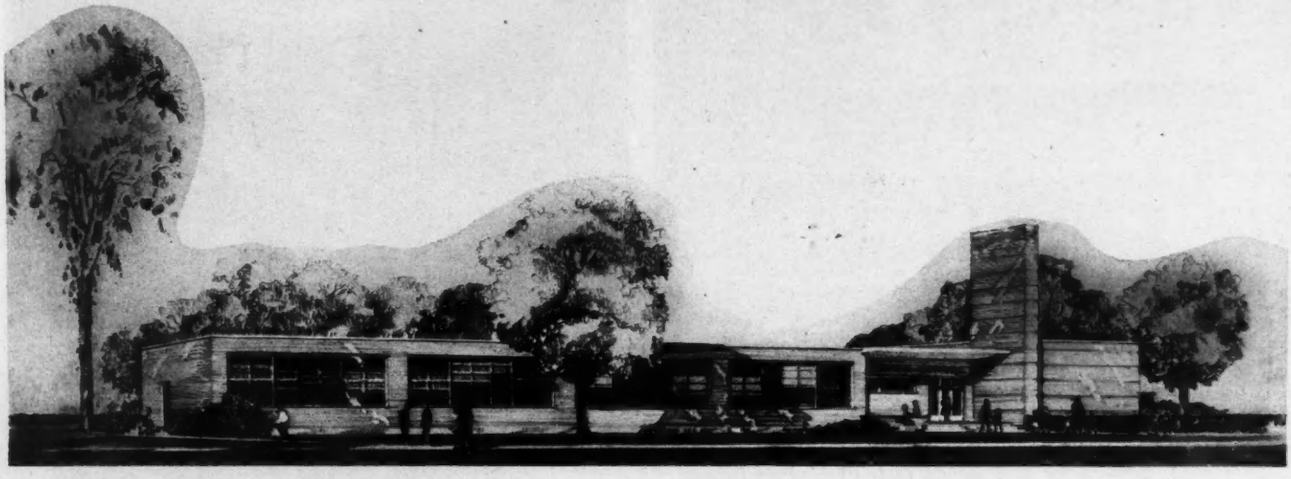


Above: house for Dr. and Mrs. M. Lenz, New Rochelle, N. Y.

RUTH REYNOLDS FREEMAN

Burlington, Vt.

Mrs. Freeman studied architecture at Cornell University, graduating in 1936 with the degree of B. Arch., and receiving second place in the Competition for the A.I.A. Medal, the award being based on "general excellence throughout the course." During the war she worked for a Washington, D.C., architectural firm doing emergency housing projects and hospital design, and also did scale drawings for aircraft identification purposes. She and William W. Freeman, A.I.A., opened their own office when they were married, later taking into partnership J. C. French, Jr., A.I.A. "I have managed to get along well with most clients and contractors," she writes, "but I actively resent the person who beams on me and says, 'Well, I suppose you do all the kitchens.'"



Above: Perspective of the S. W. Thayer School, Burlington, Vt., a small grade school with the accent on space, light and child comfort. Each of the first four grades has a separate project area and outdoor play court. The projects shown on this page by Freeman, French and Freeman, Architects

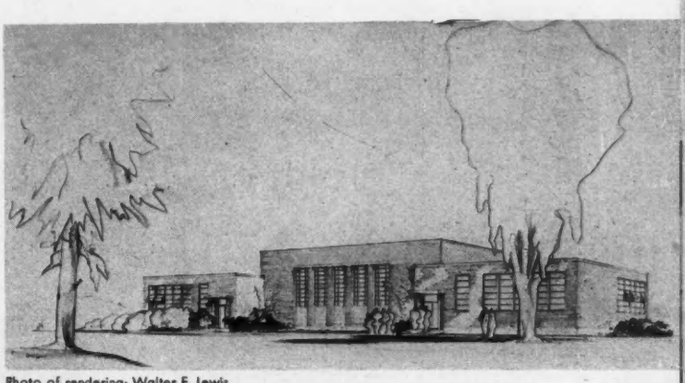
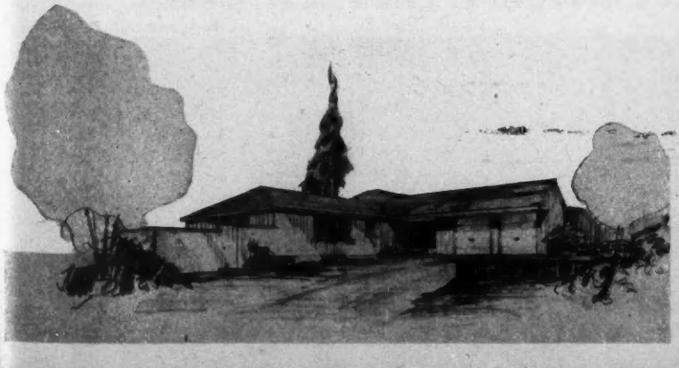


Photo of rendering: Walter E. Lewis

Right: auditorium and school building, Brandon State School, Brandon, Vt. Separate wings for boys and girls, with an auditorium-playroom between

Below: residence for Dr. and Mrs. Felix Cunningham, at Malone, N.Y. At right: the house which the Freemans designed and built for themselves in Burlington, Vt.



LAVONE DICKENSHEETS SCOTT, A.I.A.

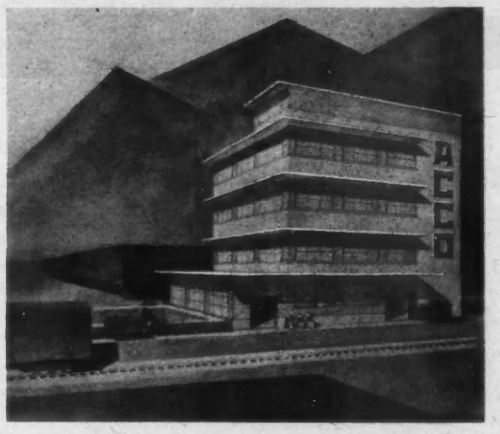
Houston, Texas

Graduating from Rice Institute with a B.S. in Architecture in 1934, Mrs. Scott began her career as a "glorified office girl" in the office of Birdsall P. Briscoe and Maurice J. Sullivan, Architects, of Houston. Following her marriage she spent a year and a half designing houses for sale, completing over 50 houses in that time. She then opened her own office, which she has maintained ever since with the exception of the war years when she was Assistant Maintenance Engineer for a large industrial company, handling construction that ranged from steel sheet pile bulkheads to offices. Since the war she has designed a shop, a duplex, several residences, and several remodelings. She considers architecture "one of the most logical of professions for a woman."

Roulande Houston Photo

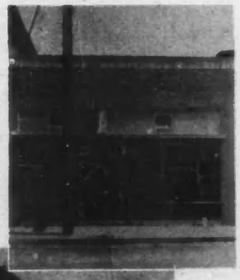
Bob Bailey Photos

Above: three views of a residence in Houston, completed last December. Hollow cell, poured concrete walls and concrete slab foundation, built-up tar and gravel roof, aluminum windows



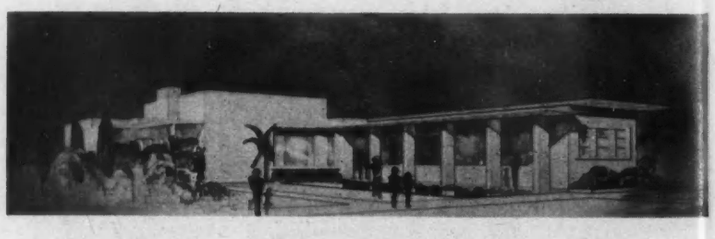
Bob Bailey Photos

Bob Bailey Photos



Right: design for proposed Vegetable Oil Refinery in Mexico. Right, below: demonstration and experimental kitchen building designed for the same Mexican refinery

Left: before-and-after views of a shop remodeled for Kyle Morrow, Houston, Texas



Below: "Wavertree," residence for Mr. Mark Edwin Andrews of Houston, was designed around the owner's collection of Early American furniture. Below, right: the "Pilgrim Room" of the Andrews residence is a separate wing that is in effect a complete little 17th century home

Bob Bailey Photo

Roulande Houston Photo

EDLA MUIR, A.I.A.

Los Angeles, Calif.

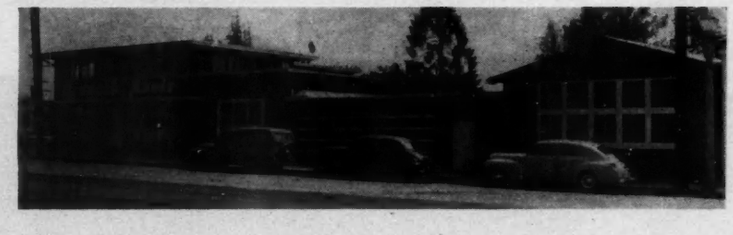
Edla Muir had no formal architectural education. When she was 13 she started working after school, on Saturdays and during her summer vacations in the office of John Byers, Architect. She continued with him full-time after graduation from high school, gradually building up her own practice. When this country entered the war she opened her own office, and is currently specializing in residential and commercial work. Her first independent commission, she reports, was hard to get, but since then it has been "quite simple." "I have heard a lot about prejudice toward women," she writes, "but I personally have encountered very little of it. . . . Once some background has been acquired it is a foregone conclusion that the public is most willing to accept a woman in domestic architecture."

House for Dr. and Mrs. James L. McPherson: right, front entrance; far right, rear or garden elevation

Maynard Parker Photos

Robert Cleveland Photos

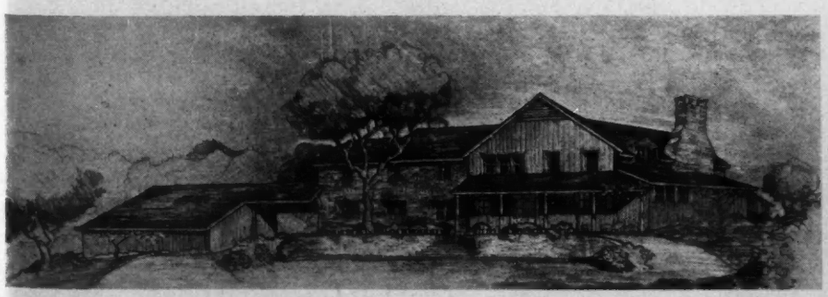
Left: office building for Grant Oil Tool Co., remodeled by Miss Muir. Painted dark green, aluminum trim. Below: building for Paddock Pool Co.



Immediately below: residence for Henry Thiem. Bottom of page: house for Mr.. and Mrs. V. D. King, Mandeville Canyon, Calif.

Top, Maynard Parker Photo; Bottom, Miles Berne Photo

Below: house for Robert Taylor and Barbara Stanwyck



MARIE FROMMER, R.A., Dr.-Ing.

New York, N. Y.

After receiving the Architect's Diploma from the I.T. Charlottenburg (Germany), Miss Frommer worked as assistant architect in private offices and with the municipal office at Dresden. Postgraduate study at the I.T. Dresden and a thesis on town planning won her a Doctor of Engineering degree. She established her own office in Berlin in 1926, designing and superintending the construction of private houses, department stores, hotels, stores and office buildings, all complete with interior design and furniture. In 1936 she moved to London, where she maintained her own office for four years, shifting her headquarters to New York in 1940. She is registered in the state of New York, doing residential and commercial work.

Lotte Jacobi Photo

Left, an interesting door detail. Below, House Frankl penthouse, Berlin-Dahlem

Ben Schnall Photo

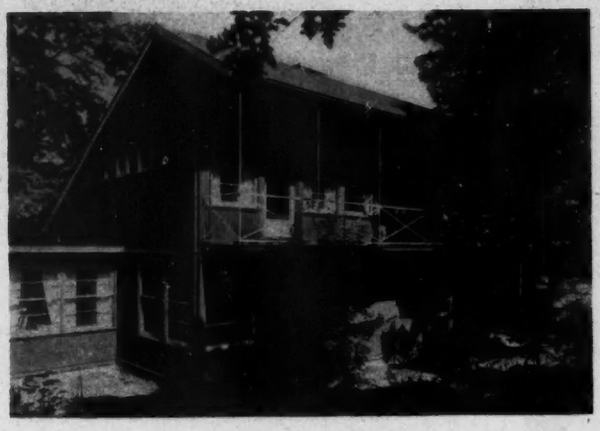
Library of law office for Mansbach & Paley, New York

Left: store for Greco Shoes, Paris-Deauville. Below, stairway in Swiss Life Insurance Building, branch office, Berlin

ELEANOR RAYMOND, A.I.A.

Boston, Mass.

One of the most widely known of the country's women architects, Eleanor Raymond studied at the former Cambridge School of Architecture and Landscape Architecture for three years, and received the M.Arch. degree from Smith College in 1934. Her first professional work was done as a draftsman in the office of Henry A. Frost, Architect and head of the Cambridge School. Registered in Massachusetts, a member of the American Institute of Architects and of the Boston Society of Architects, she is now owner of the Office of Eleanor Raymond, Architect, of Boston, and is specializing in residential work. During the war she did drafting at the Radar School of the Massachusetts Institute of Technology.



Left: rear view of an all-plywood house in Dover, Mass., built on a 4- by 8-ft. module; balcony serves three bedrooms, is not cantilevered but hung by rods from overhanging roof

Paul J. Weber Photo

Above: all living quarters of this house in Belmont, Mass., are at the rear to take advantage of view and morning sun; exterior is gray-green, with berry-red door and trim

Haskell Photos

Left: house in Dover, Mass., is built of Masonite inside and out, including not only walls and ceilings but floors, kitchen cupboard doors and counter tops

Left: house designed for Eleuthera in the Bahamas. Below: interior of sculptor's studio in Dover, Mass.; stairway leads to balcony housing owner's sitting room and bath

George H. Davis Studio Photo

LUCILLE BRYANT RAPORT, A.I.A.

North Hollywood, Calif.

Mrs. Raport studied architecture at the University of Kansas from 1937 to 1941, graduating with the degree of B.A. in Arch. and the general five-year B.S. degree, in addition to the Thayer Medal. Starting her career as designer-draftsman in the office of Neal O. Rayburn, Architect, of Kansas City, she spent the war years as chief draftsman, designer and draftsman for firms in Mobile, Ala., Kansas City, Chicago, Inyokern, Calif., and Los Angeles. She now has her own office (Raport and Hicks, Lucille Bryant Raport, Architect), is doing chiefly residential and commercial work. Registered in California, Mrs. Raport is a member of the A.I.A., and president of the Los Angeles Chapter of the Women's Architectural Association.

Mountain cabin for Mr. and Mrs. John Lockwood at Lake Arrowhead, Calif., shown in detail in last month's RECORD

ELIZABETH SCHEU CLOSE, A.I.A.

Minneapolis, Minn.

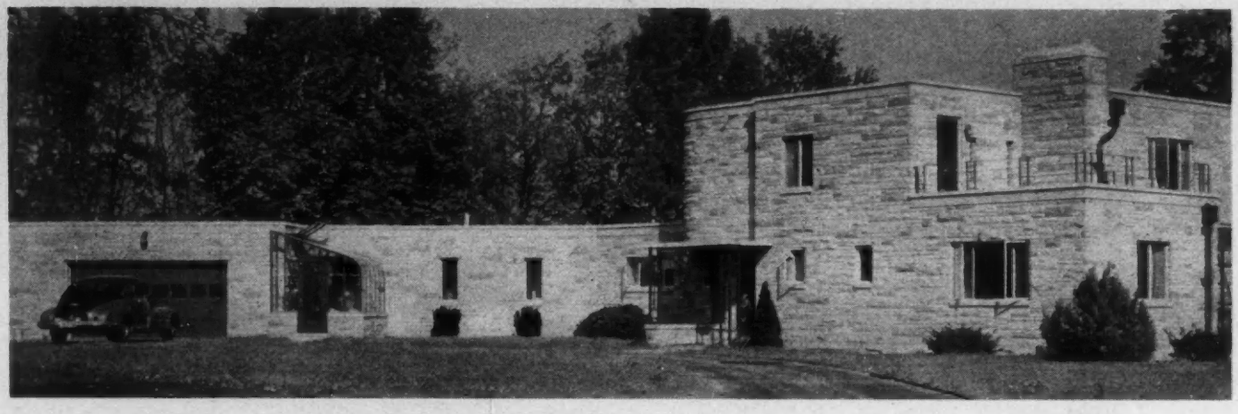
"People are still inclined to snort or laugh at us," says Elizabeth Close, "but architecture is a fine field for women. We can contribute a lot, especially in residential design. . . ." Mrs. Close, a native of Austria, received her architectural training in Vienna and at the Massachusetts Institute of Technology, receiving her M. Arch. degree from M.I.T. in 1935. Her first job was as a draftsman in the office of Oscar Stonorov, Philadelphia. In 1938 she opened an office with W. A. Close under the firm name of Close and Scheu, which was quickly changed to Elizabeth and Winston Close when she married her partner. The firm specializes in residential work, is busy "designing homes for people who want contemporary houses."

Left: weekend cabin on the St. Croix for Dagmar Doneghy Beach, built into the steep east bank of the river gorge, with the earth slope coming down over the roof. Below, house for William Luyten

BARBARA W. SIEMENS, A.I.A.

Chicago, Ill.

Barbara Wolfe Siemens was still an undergraduate at Ohio State University when she obtained her first job — as a draftsman in the office of Howard Dwight Smith, the University Architect. Graduating in 1945 with the degree of B. Arch., she moved to Chicago and became affiliated with the office of Ralph D. Huszagh, Architect, John Demuth, Associate. She is so satisfied with that connection, she writes, that she has "never struck out" for herself, but she does occasionally accept independent commissions, such as the house shown below. Designed for Mr. and Mrs. Stanley Wolfe, and located near Fremont, Ohio, it is built of Ohio sandstone, with steel joist, concrete floors and masonry walls. Heating is radiant, with copper piping.



LARCH RENSHAW, A.I.A.

Darien, Conn.

Larch Renshaw is already familiar to ARCHITECTURAL RECORD readers as the author of a series of closet details published as Time-Saver Standards. A graduate of the Columbia University School of Architecture, Mrs. Renshaw began her career as a draftsman for the Small House Advisory Service, and has stayed close to the residential field ever since. One of her most interesting assignments came in August, 1946, when she was engaged as Executive Director of the Town of Stamford (Conn.) Housing Authority. In the following 14 months she supervised the development of a veterans' village of 76 homes, 50 of them prefabs designed by Donald Desky Associates for Shelter Industries. Mrs. Renshaw is registered in New York, Connecticut and Virginia.

Above: one of the 50 prefabs erected by the Stamford Housing Authority for veteran occupancy under Mrs. Renshaw's supervision

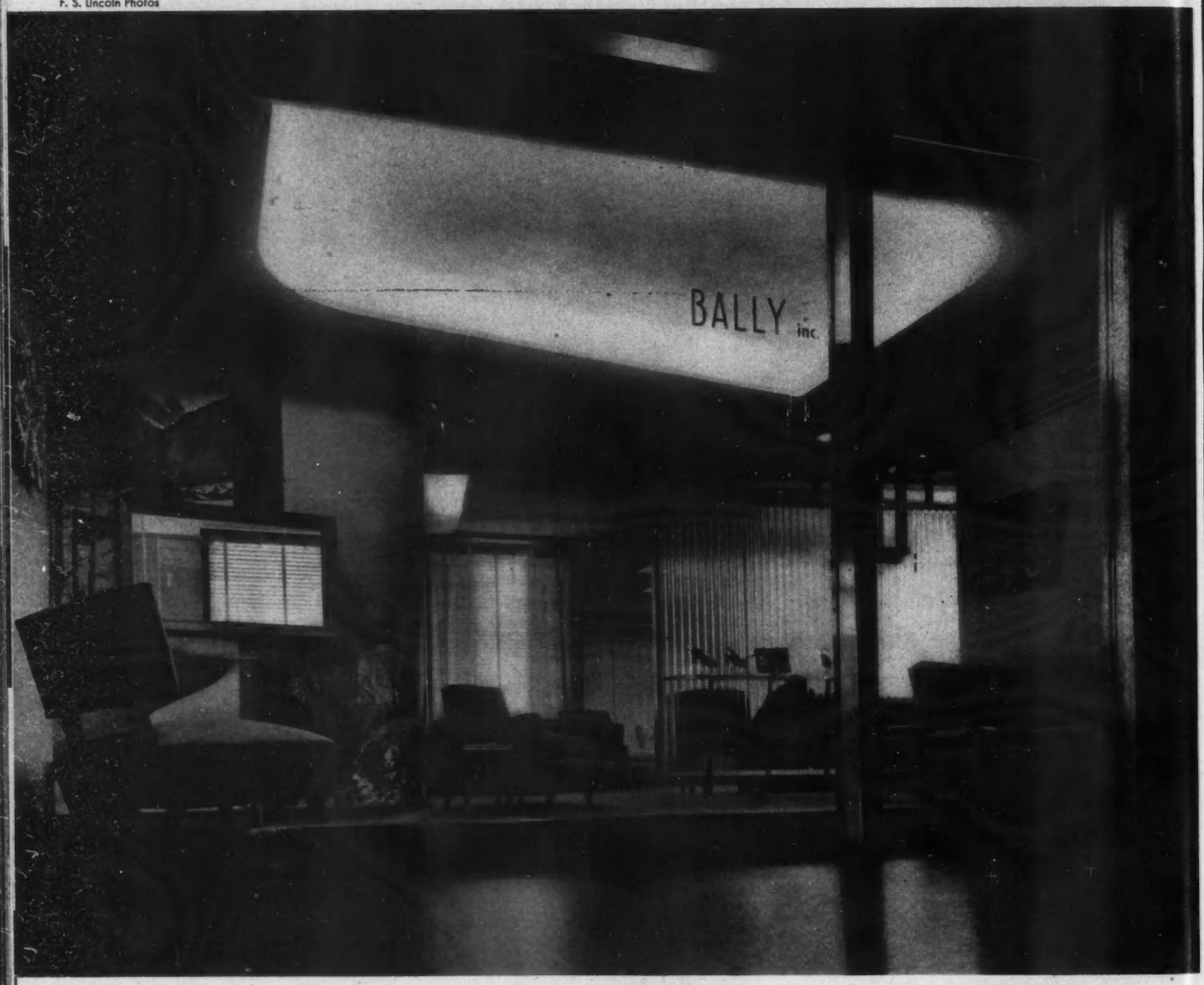
Right: the architect's first commission: a dog kennel with a sun room. "I made the dogs very comfortable," comments Mrs. Renshaw

Below: left, house for Mr. and Mrs. Allen, Darien, Conn.; right, house for Pembroke Corp., Darien

BALLY SHOWROOM FOR SHOES

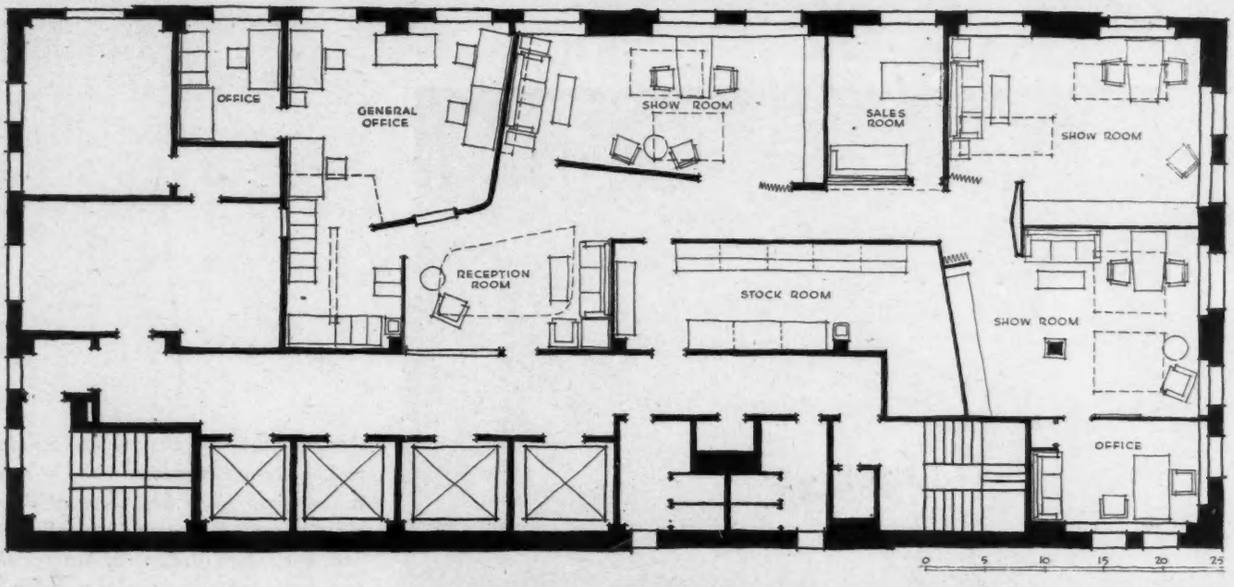
New York City — *John R. Weber, Architect*

F. S. Lincoln Photos

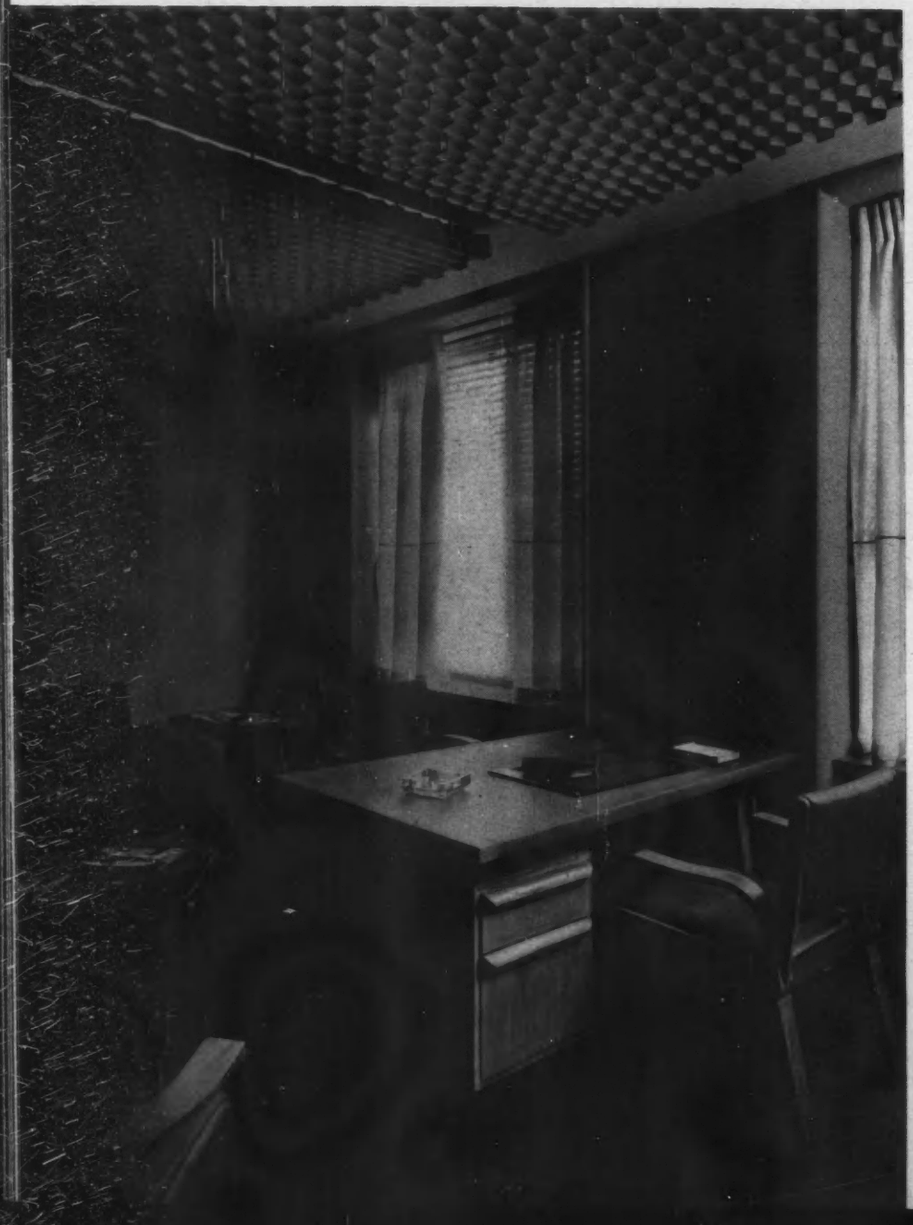


A BUYER who has been making the rounds of New York's showrooms must experience, when he comes to this one, a new sense of respect for architecture. For he will previously have been exposed to untold, in fact unspeakable, variations of "modern" eye-catchers, with padded walls and garish colors and Baroque confections and tricked-up lighting. This one speaks with another personality, not a shy one certainly, but not a strident one either. There is a certain authority in its visual message, born no doubt of bold directness of purpose. The visiting buyer must certainly register, if only subconsciously, the omission of superficial flummery. The photo murals provide a Swiss background (Bally, Inc., sells shoes imported from Switzerland). The shoes are effectively but not loudly displayed in the reception room; active showing is in the showrooms.

Reception lobby is relatively small, but the open-corridor scheme gives it spaciousness, and opens it invitingly toward the showrooms where shoes are displayed



Principal showroom, just behind reception room, features large photo mural of Swiss scenery, shoe factories in foreground. Lighting is cold cathode behind egg crates

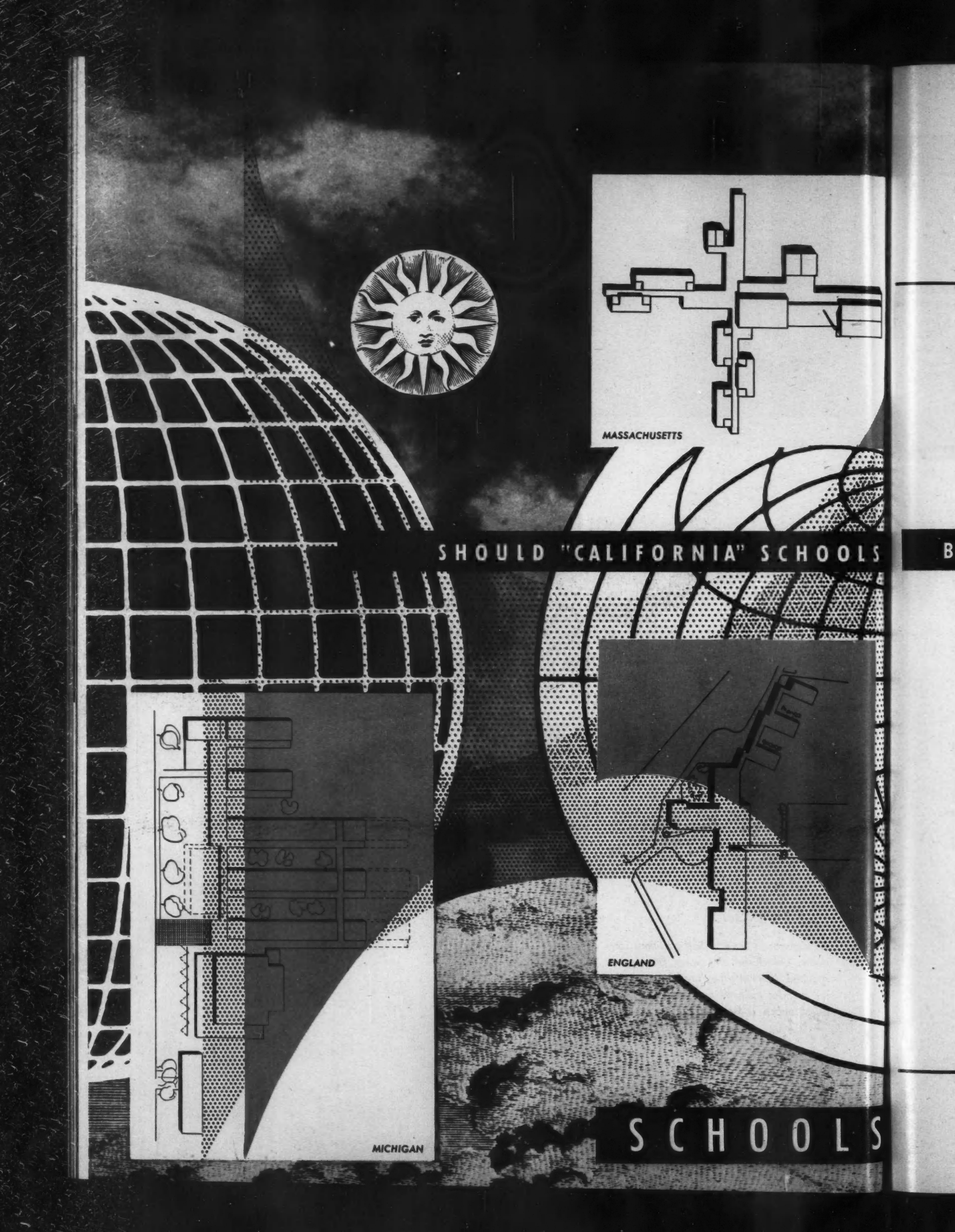


Above, left: view along open corridor, looking toward reception lobby. Above: a view from lobby into principal showroom. Mirror in background adds effectiveness to displays of shoes by live models. Left: each showroom contains a desk with leather covering, as the desk top is the place where shoes are finally selected

F. S. Lincoln Photos

Shoes are displayed in recessed wall cabinets closed by curtains. Shoes stand on plate glass shelves, with plastic strip for heel stop. Cases are lighted from above by cold cathode lighting. Below are drawers for extra stock

All showrooms have folding partitions for doors, are closed only when privacy is required. Normally they are kept open to the corridor to invite entrance. Only the office space is actually partitioned off


MASSACHUSETTS
SHOULD "CALIFORNIA" SCHOOLS
ENGLAND
MICHIGAN
SCHOOLS

WHAT WE LIKE ABOUT ONE-STORY SCHOOLS

By Wilfred F. Clapp *Assistant Superintendent School Organization and Plant, Michigan Department of Public Instruction*

BE BUILT ELSEWHERE?

At the school seminar of the A.I.A. convention last year at Grand Rapids, the question about California schools was the one most often repeated. Next in frequency came the query, "Why don't the magazines tell us more about daylighting methods and objectives?" Fortunately there were on hand two men pre-eminently in a position to address themselves to both questions — and in relation to one another. Wilfred F. Clapp of the Michigan Department of Public Instruction, and Charles D. Gibson of the California Division of Schoolhouse Construction had just finished a joint tour of Michigan as field representatives of their respective offices, had talked with school architects the length and breadth of the State. (Incidentally, as the frontispiece suggests, the "California" school is really native to countries such as England, Switzerland, Sweden, is an international development not restricted to southern climates.)

Both authors are examples of that rare and slowly multiplying type of state official who takes delight in helping responsible architects to make progress. This school study has turned up enough material for another forthcoming article on "16 More Ways to Daylight a Classroom" by RECORD associate editor Douglas Haskell, in a later issue.

THERE are certain attributes which we very much want in a school building and which we believe can be obtained most easily and economically in the structures that have a resemblance to the so-called "California" type.

1. We want buildings which are friendly to children. We believe that the low-lying, sprawled-out type of building, close to the ground, one story high, straight in its lines, honestly functional, is less awe-inspiring and more friendly in the eyes of the child, though it may not look as grand to adults as some of our multi-storied Roman efforts.

2. We want buildings which are safe. No matter how fire-resistive the materials are, a structure can never be actually fireproof, for the minute we move into it we introduce fire hazards. No matter how well a stairway is designed, vertical travel is more hazardous than horizontal, especially in time of danger. As the earth-bound structure is opened up in plan, a great many more exits can be provided so that the building is evacuated in a flash.

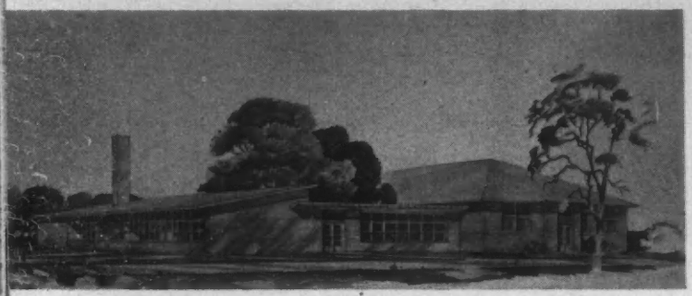
3. We want buildings which are healthful. Health refers to more than sanitation alone. It certainly involves good seeing conditions, good hearing, satisfactory warmth and fresh air.

a. Visual conditions. The more extended discussion of this topic is left to my colleague, Mr. Gibson. Suffice it to say that in single-story open-plan schools good daylighting is comparatively easy to obtain; in multi-story schools it is more difficult.

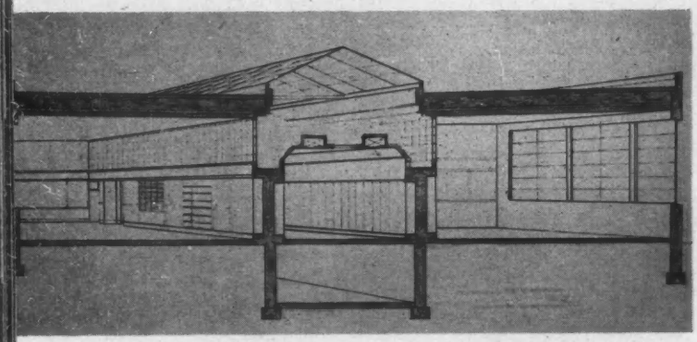
b. Acoustical conditions. The open plan makes it easier to isolate noise-creating activities such as the shops, gymnasium, band room, orchestra.

c. Heating and Ventilating. In large systems with adequately trained maintenance staffs, the "split" system of heating and ventilating works economically and well. In smaller cities and villages, the more elaborate systems frequently get out of order, are not properly repaired, do not operate satisfactorily. If, as sometimes happens, fan systems are shut off entirely, the high first cost of motors, fans, ducts and controls, is a tremendous waste of funds. Also, successful operation may require that all windows and interior doors be kept closed; this seldom happens in most schools. As plans are opened up, we believe that window ventilation and controlled heat

Frontispiece by M. Peter Piening



In both the Sheridan Road elementary school (above) north of Lansing, and the Bullock Creek school at Midland (across-page), architect St. Clair Pardee had the problem of adding rooms to conventional existing schools. In both, bilateral lighting was worked out through a clerestory building section of exceptional design merit. Because of the skill shown in harmonizing the new with the old (without "matching") both schools will be shown more fully later



In his handsomely planned rural community school for Concord, Michigan, architect Carl C. Kressbach has achieved multi-source daylighting in a plan that retains the greater compactness of the central corridor, by skylighting the corridor, dropping its ceiling, putting classroom transom lights above (This interesting trend is apparently widespread — see Ohio and Louisiana examples on later pages of this study)

Hedrich-Blessing Photo

The Oakdale Christian School at Grand Rapids, by Architect James K. Haveman, has directional glass block to carry daylight to interiors of classrooms of accustomed rectangular shape

(panel or other) may offer the best possibilities of satisfactory operation throughout the life of the building.

4. We want buildings designed for instructional utility and interior flexibility. Teachers ask for more space per child, to serve informal activity programs, which go beyond mere sitting, listening, reciting. If space is lengthened at "standard" width, there results an awkwardly long room. Widening instead of lengthening produces a useful squarish shape; this requires either artificial lighting at the inside wall or else *multi-source* daylighting (coming from both sides or in part from above). Even on dark cloudy days there is adequate light outdoors — 300 foot-candles or more. Why not design our buildings to let it in? This is easier in single-story plans.

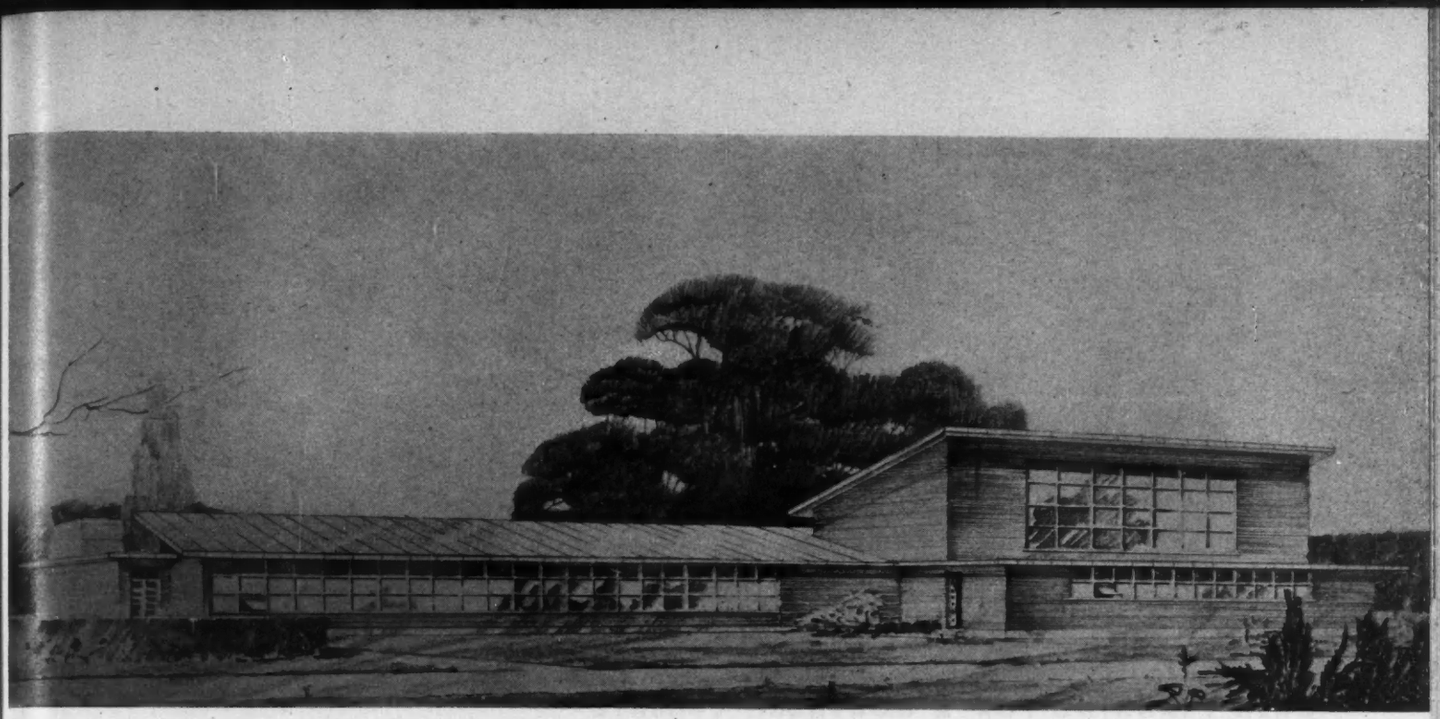
5. We want buildings adaptable to change. If there is any one thing we know about the educational program, it is that changes are going forward always. Buildings must not prevent them. There must be no trouble about rearranging interior partitions, interior dispositions.

6. We want buildings that can be built in sections, in keeping with limited financial means matched against expanding needs. We need buildings which, although expandable, do not force the continuation of obsolete architecture when additions are eventually built. For some time, respectable school architecture has embodied the principle of expansibility, by means of open-end corridors, sanitary systems, and the like. The trouble is that the addition may not be built for twenty-five years. By that time the world, the educational program, and the architecture have all changed. Rather than let a 25-year-old building dictate the future, why not, even in rigorous climates, sketch out a long-term campus plan with buildings of open type connected by corridors? Each one of these wings or "fingers" can be made self-sufficient in heating and other facilities. Automatic firing burners and gaseous or liquid fuels have removed the indispensability of central heating plants.

In Michigan, as in some other states, there are severe (constitutional) restrictions on the financing of buildings. Bond issues are limited to five years. Such restrictions bring about opportunistic, haphazard building methods in terms of pressing needs, unless a sound long-term program can be developed in advance. The total cost of producing a complete school plant for a long-term plan will far exceed the school district's immediate financing ability. Yet if the long-term plan can be prepared as a series of successive steps, there is the possibility of ultimate coherent realization. It seems to us that the open type of plan lends itself especially well to overcoming such financing restrictions.

As later units are built they are, in most respects, independent buildings. Their architecture can be free of any desire to *match* existing construction and can embody sound later developments in design while still broadly *harmonizing* with the old by virtue of the architect's skill.

The combination of desires expressed in the first part of this article has resulted in the trend which the il-



lustrations show. Notes on each of these new Michigan school projects are appended to the illustrations.

Possible Drawbacks

1. "What of the cost, compared with a block type of structure?" Probably this conventional type would be the cheaper, *if we used the same construction materials and methods.* In point of fact, the low type of building does not demand the same solidity and fireproofing, because of the far smaller hazard. Codes should be eased to recognize this difference.

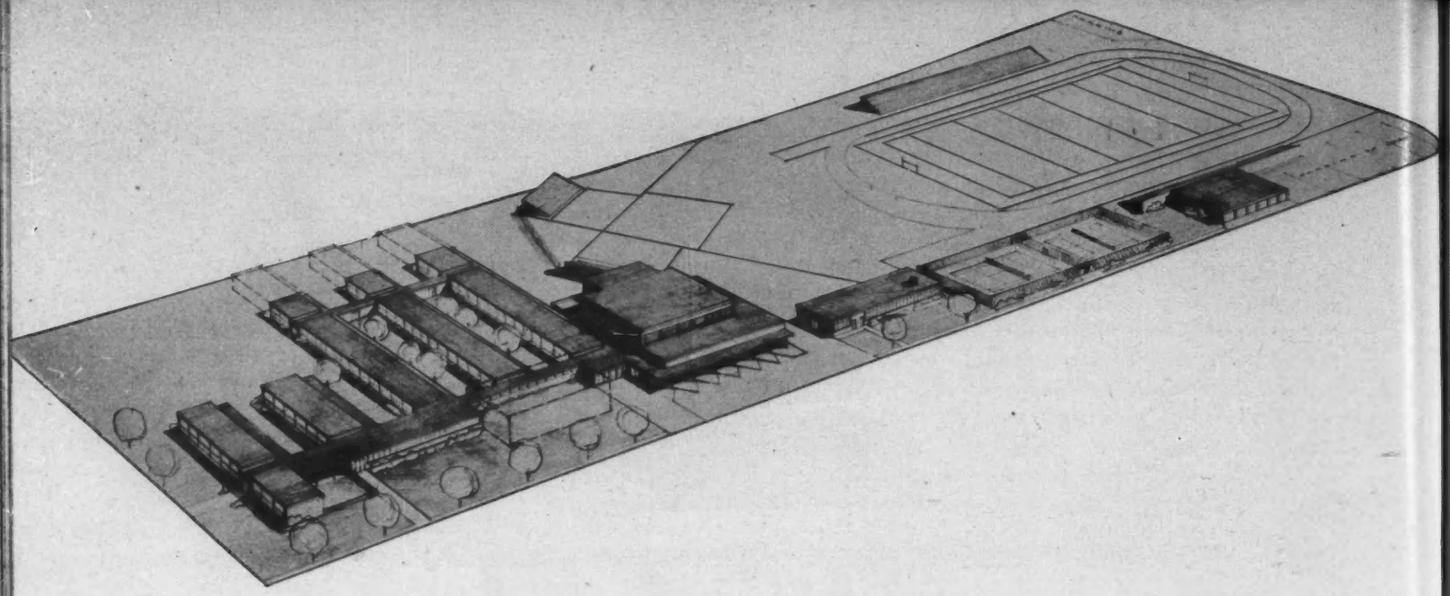
2. Operation and maintenance costs. Greater roof areas mean greater heat loss; also, roofs are the part of the structure that presents maintenance problems. But, again, is this not a matter of sound design in terms of problems to be expected? Certainly we have nothing to boast about in conventional design, where we so often find disintegrating parapet walls, broken flashings, leaking roofs. An architect who practices in the snow country tells me that he believes he can handle snow better with a simple flat-slab roof design than he can with the conventional parapet walls. He is not worried about the gathering of snow in clerestory recesses.

3. "Clerestories will add to heat loss, will leak when ice and snow pile up." There is no doubt of the added heat loss even if glass block are used for insulation. The heating system must be designed in correlation. Certainly a heating system that permits a high heat differential between floor and ceiling is not best. Perhaps radiant heating, of the panel type, is the answer. For years those school-board members who operate industrial plants have been cheerfully using sawtooth roofs, monitor roofs, clerestory sections, skylights; apparently problems of heat loss and leakage have not been insurmountable and, if they exist, have been outweighed by the desire to get some daylight into the buildings so that the workmen might see.

4. "More land area is required by open planning." This is true, of course. The only reply is that there should be careful consideration of values. How important are our children? How important are the safety and educational advantages of the open type of construction weighed against the added land cost? Most school sites are too small anyway, it must be said; and the most efficient paring of land costs can be done by long-term planning and acquisition of sites far in advance of the actual need, rather than by skimping.

5. "Sprawled out buildings are impractical for large schools." This may be a valid objection. If we are to build elementary schools for 1200 to 1500 children and high schools for 3000 to 4000 it does appear somewhat impractical to build them all on one floor. There do seem to be techniques, however, for retaining a good many advantages using two floors with single-loaded corridors. Perhaps, too, these huge schools are so large that they cease at best to be friendly places for children and teachers to work together and become routinized.

In conclusion, we will get better school buildings in Michigan or anywhere else as we think primarily of objectives to be met, and not of patterns as such, whether old or new. Adaptations of the "California" architecture seem to us to have great possibilities; but fundamentally any locality must develop its own design. Good ideas should be put to use wherever they may be found (and England, Switzerland, or Denmark have their full share of "California" architecture); but fundamentally we must think "from scratch" about what kind of building is needed to meet our own objectives and implement our own educational program. This will bring the only sound design. If architects and administrators can think together more about needs and what they want to do in a building, rather than go about putting up someone else's building, we shall get the kind that makes all the difference.

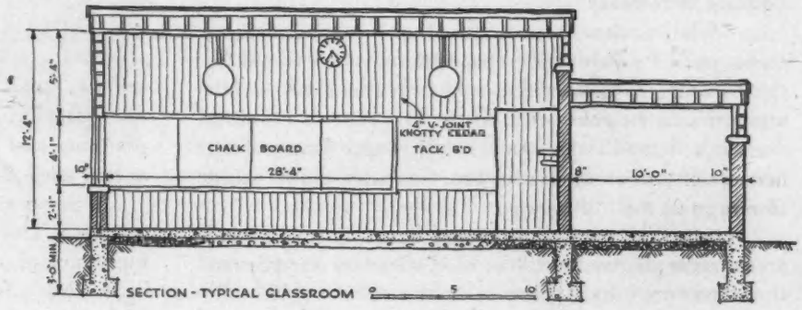


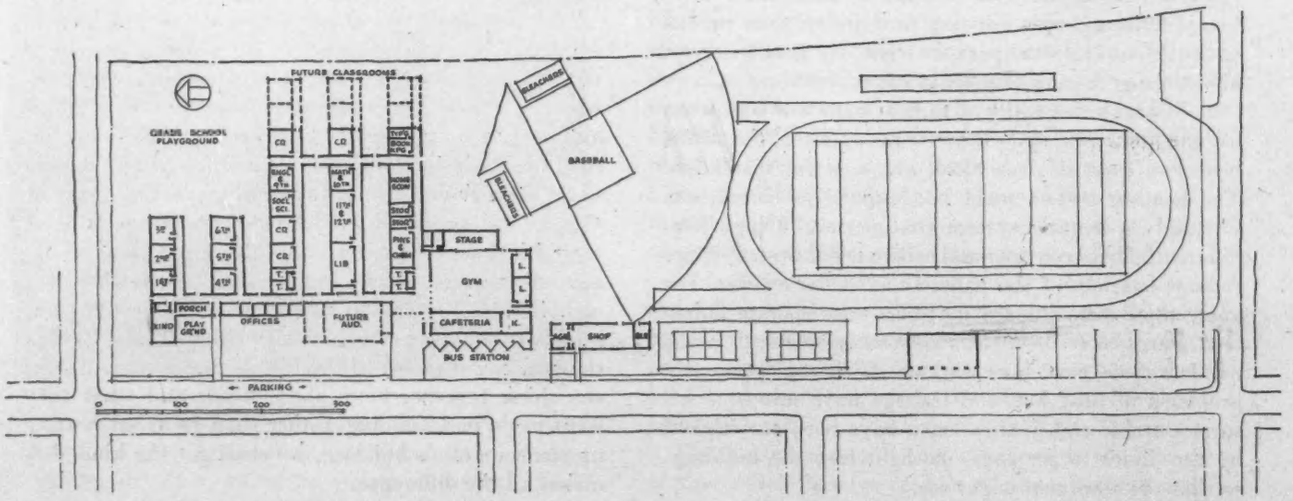
OPEN PLANNING FOR A NORTHERN CLIMATE

Elk Rapids High School, Michigan

Bauer and Eash, Architects

Though this school is not yet ready to go forward, it represents the acceptance of "open planning" methods by Michigan architects. Mr. Bauer remarks on the special advantage of master planning and separate wing technique in a rural community for limited step-wise construction and flexible organization in use. The flat roofs are welcome in snow country, clerestories are not to be feared.

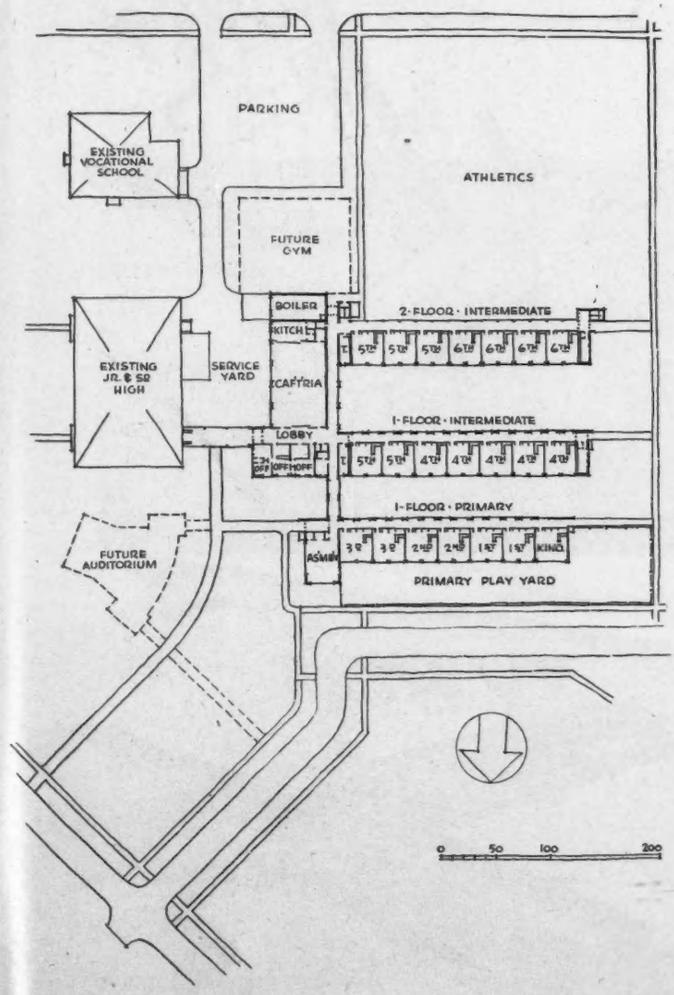




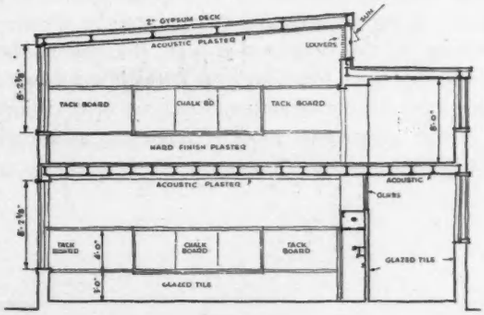
MULTI-SOURCE DAYLIGHTING IN ONE OR TWO STORIES

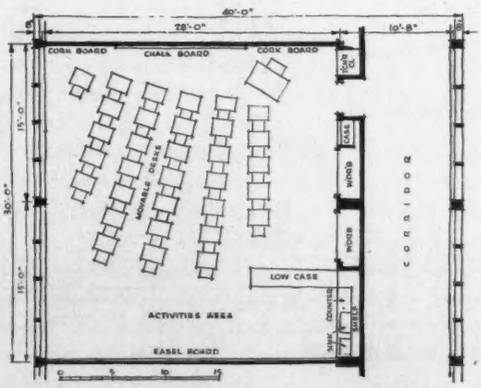
Allegan Primary and Intermediate School, Michigan

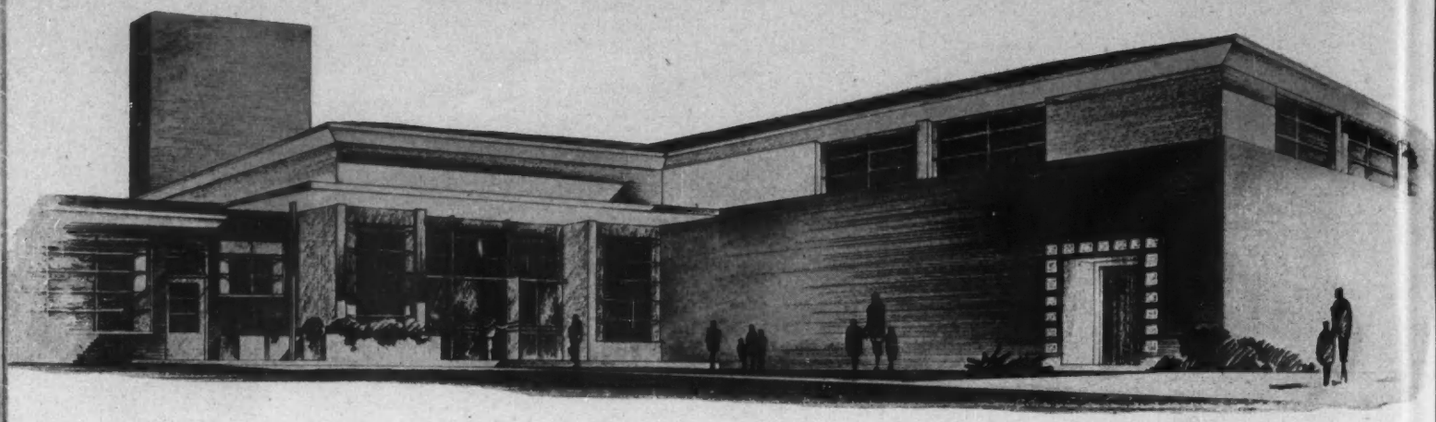
Lewis J. Sarvis, Architect



Here is another scheduled Michigan school which proves that northern architects can stand at the forefront of development. Cleanly organized and drawn, it steps ahead by applying the side corridor to two stories as well as single stories. (See page 139 for a California parallel.) Mr. Sarvis has made a square-classroom analysis that will be presented in a later issue.





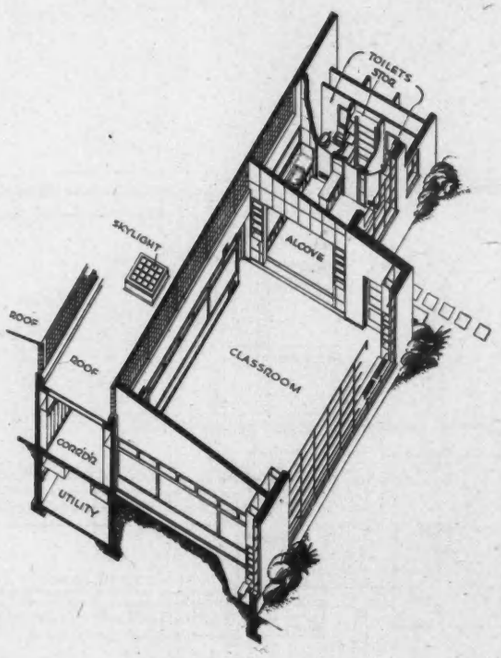


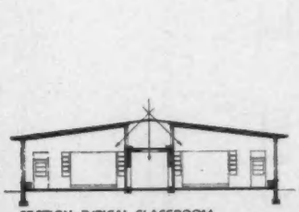
A "CENTRAL CORRIDOR" ONE-STORY SCHOOL

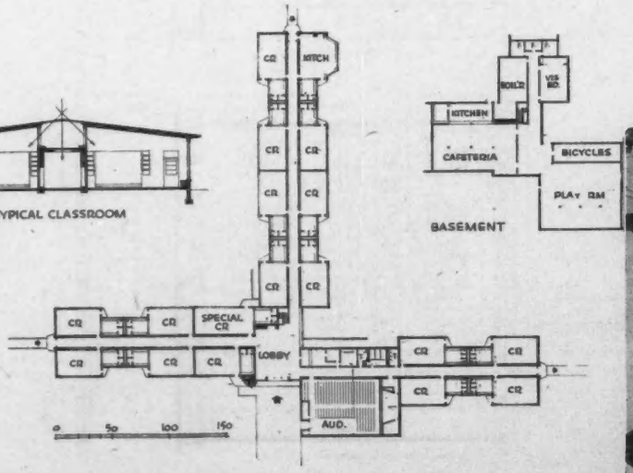
Elementary School, Perrysburg, Ohio

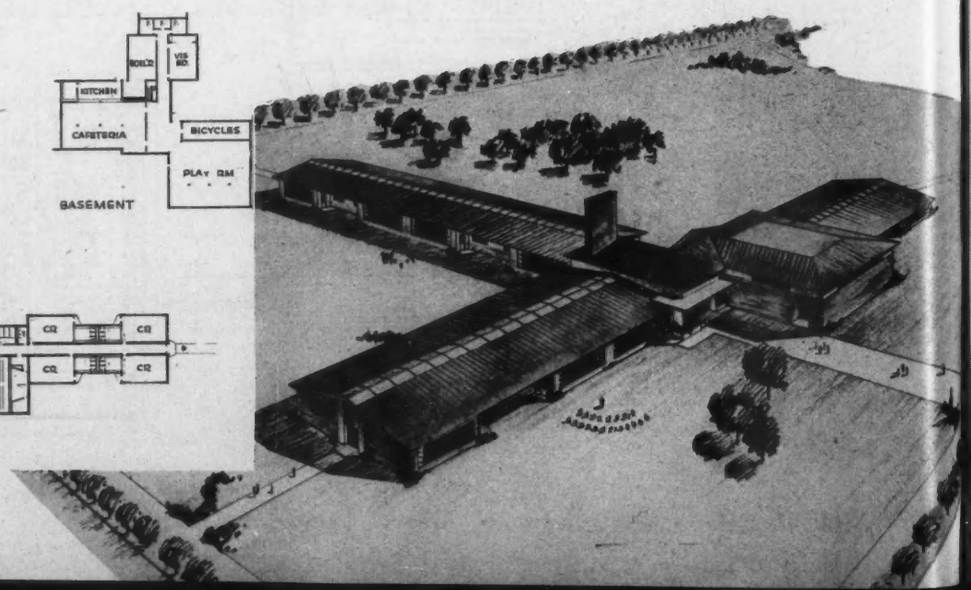
Britsch & Munger, Architects

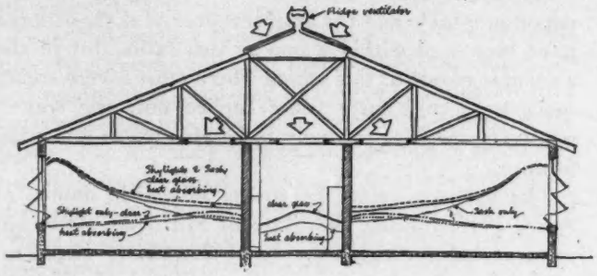
PLANNED for a 14-acre tract adjacent to a 21-acre community recreation center, this warmly human school will have room to spread in, is worth study for its community facilities at the juncture of its T plan, its carefully worked out classroom with work alcove and individual toilet facilities. Like the Louisiana school shown on the opposite page, it has a central corridor topped by a skylight, and the ceiling is dropped to permit transom lights into the classrooms taking advantage of this overhead source. Because of the difference in climate it was necessary to specify heating coils for the dropped corridor roof slab to prevent formation of ice from the higher classroom roofs. Construction is delayed as a result of high prices.

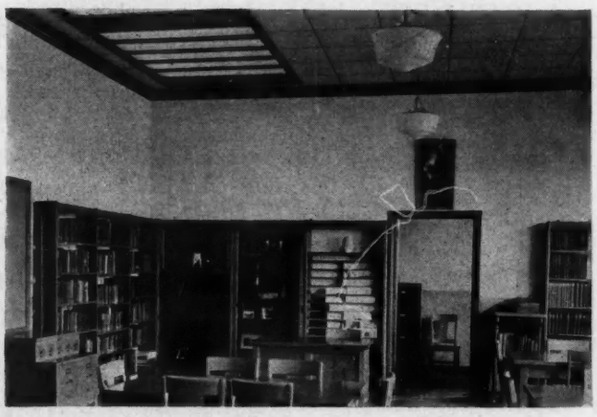












DAYLIGHT IS BRIGHT ENOUGH EVERYWHERE IF WE ARE

By Charles D. Gibson

Field Representative, California Division of Schoolhouse Construction

LET no reader of this article suffer under the illusion that the authors have begun at the beginning. The space limitation and specialized subject field set for this effort will not permit a discussion of the basic educational and health considerations which provide most of the real concern we should have with school design problems. So, in true architectural practice tradition, let us begin our thinking on the finish side of the middle.

As background, at least three current publications, all short and to the point, merit the studious perusal of any architect:

A. "GUIDE FOR PLANNING SCHOOL PLANTS" (Tentative). Published by the National Council on Schoolhouse Construction 1946; copies available at $1.00 each from Dr. W. D. McClurkin, School of Administration, George Peabody College, Nashville, Tennessee.

B. "SPACE FOR TEACHING — AN APPROACH TO THE DESIGN FOR ELEMENTARY SCHOOLS FOR TEXAS." William W. Caudill, Bulletin of the Agricultural and Mechanical College

(*Continued on page 126*)

TOP LIGHTING AND VENTING IN THE SOUTH

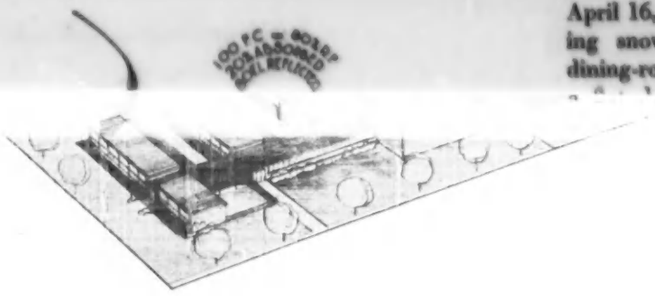
Belle Rose School, Assumption Parish, Louisiana

Bodman & Murrell, Architects

This very economical and ingenious scheme uses the attic as a combined venting and lighting plenum chamber, topped by a combined skylight and ridge ventilator. Light penetrates to the interior of the classrooms as shown: Dr. Hamon of U. S. Office of Education thought there was more than enough there. In future installations architects plan to use heat-absorbing glass. In a section where ventilation is highly important, the use of ventilation above the corridor is advantageous in eliminating the noise that is carried into classrooms from the corridor by the customary breeze sash above doors. The superintendent has reported "no leaks yet" though the skylight was installed, in very rainy country, in 1939

FC × RF = FL

FOOTCANDLES — REFLECTION FACTOR — FOOTLAMBERTS



California is not one glorious day of sunshine after another, nor are areas like Michigan populated by a mole-like race living in semi-darkness. California has its share of days without sunshine, and on the other hand, one of the best examples of school space daylighting we ever saw was in a Dearborn, Michigan school, sub-grade, dining-room, on the afternoon of April 16, 1947. It was a dark overcast day with morning snowfall and afternoon gloom. That cafeteria dining-room was lighted by means of a light well and

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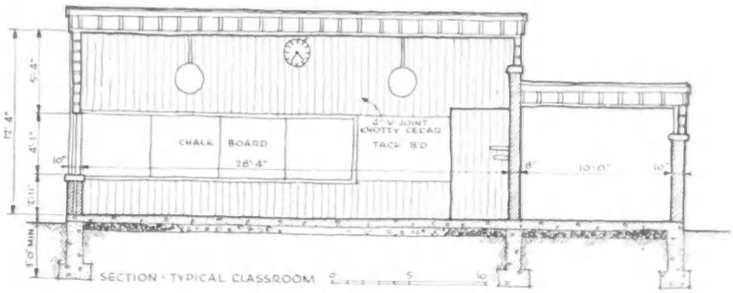
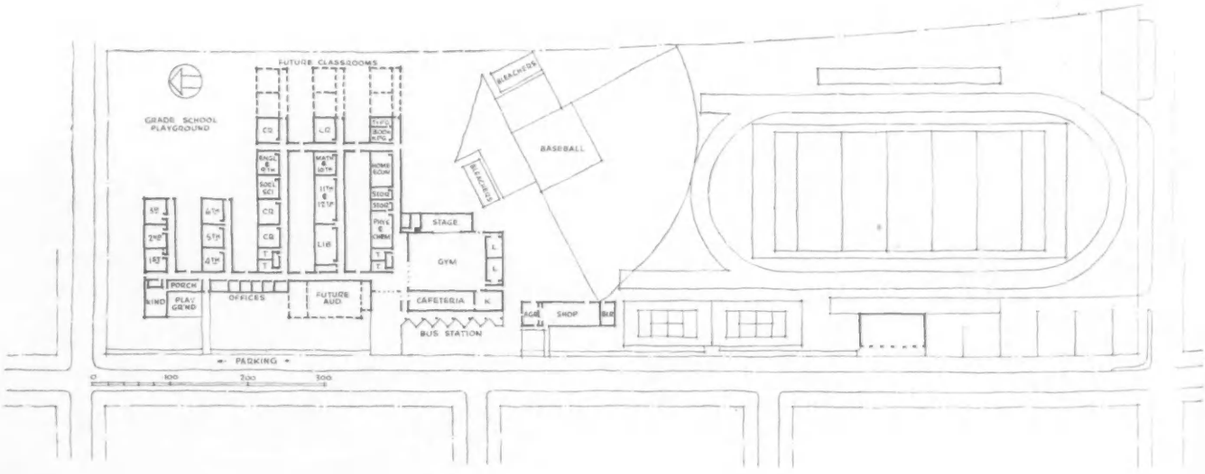
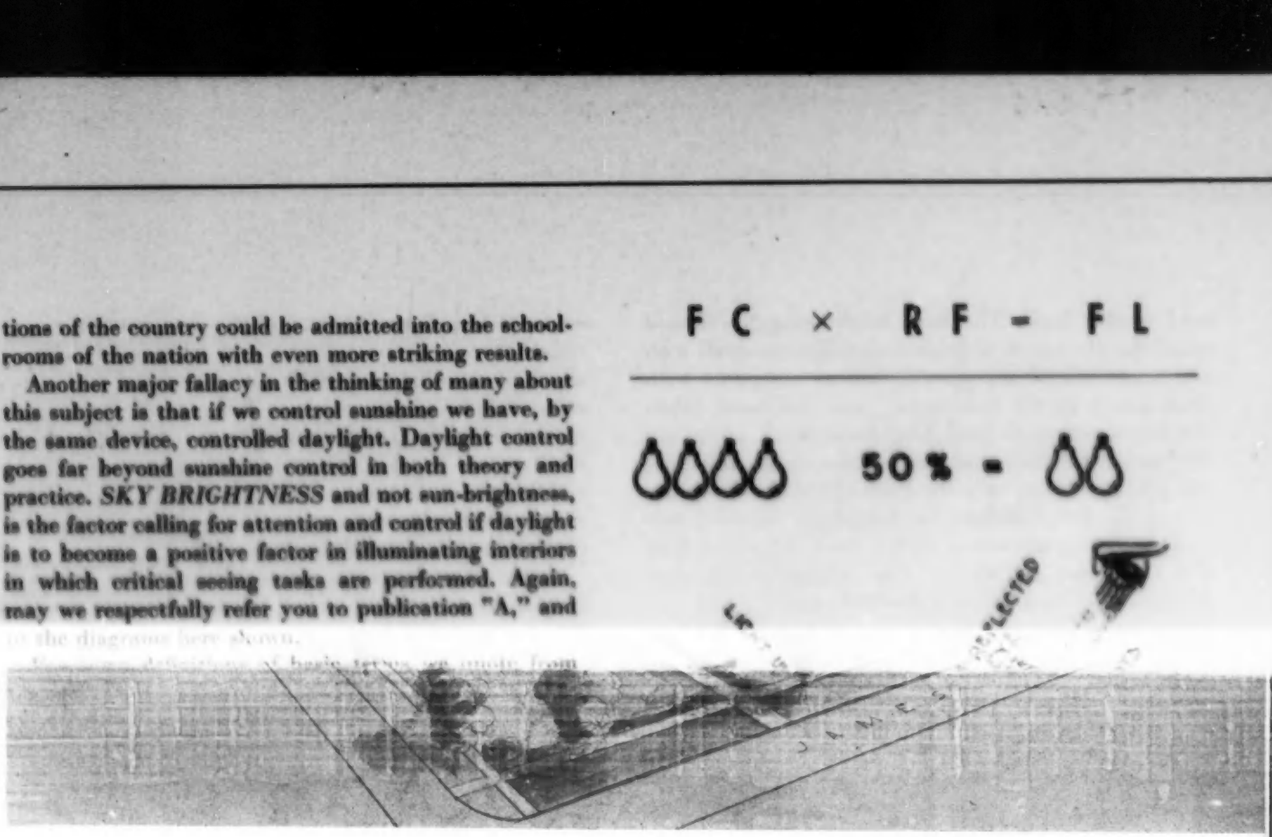




tions of the country could be admitted into the schoolrooms of the nation with even more striking results.

Another major fallacy in the thinking of many about this subject is that if we control sunshine we have, by the same device, controlled daylight. Daylight control goes far beyond sunshine control in both theory and practice. ***SKY BRIGHTNESS*** and not sun-brightness, is the factor calling for attention and control if daylight is to become a positive factor in illuminating interiors in which critical seeing tasks are performed. Again, may we respectfully refer you to publication "A," and to the diagrams here shown.



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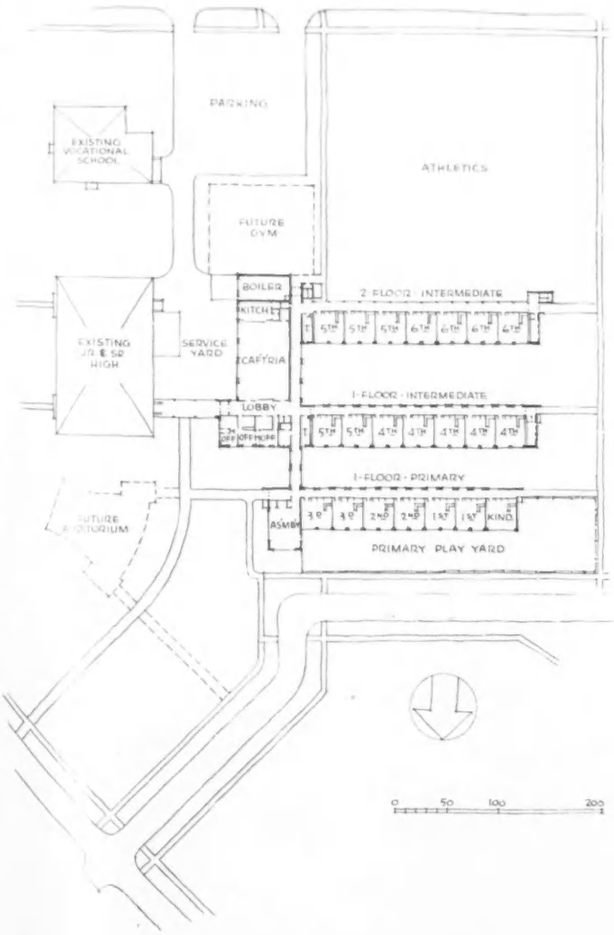

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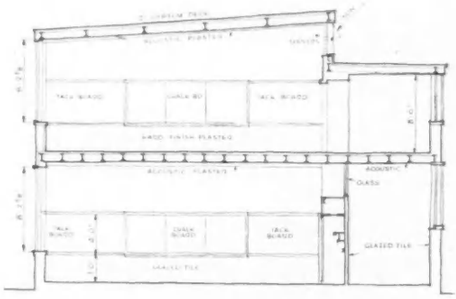
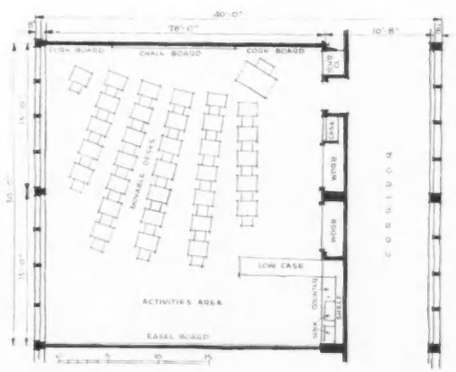
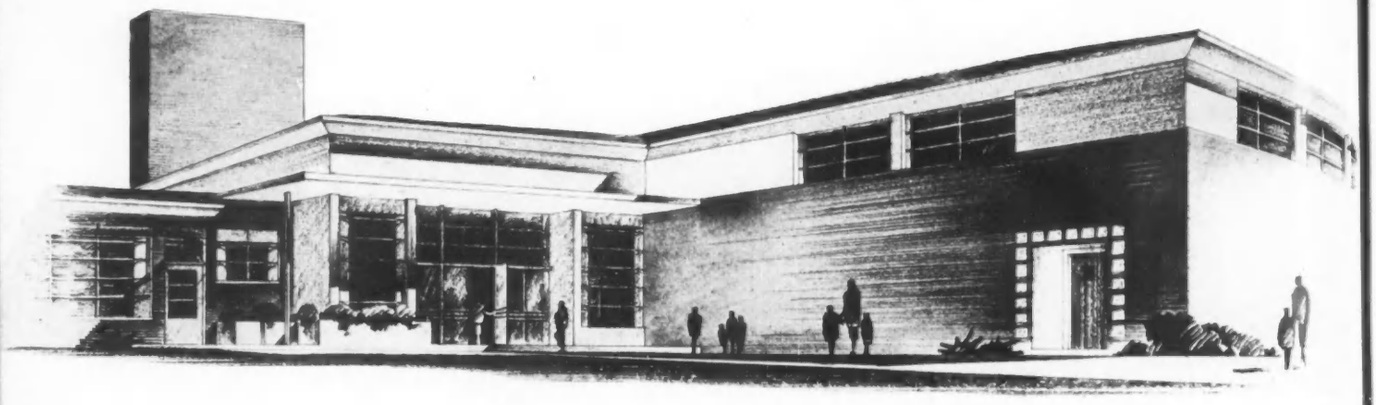




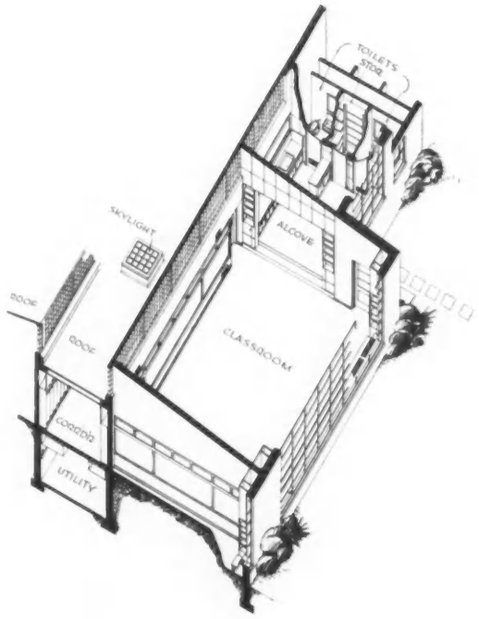


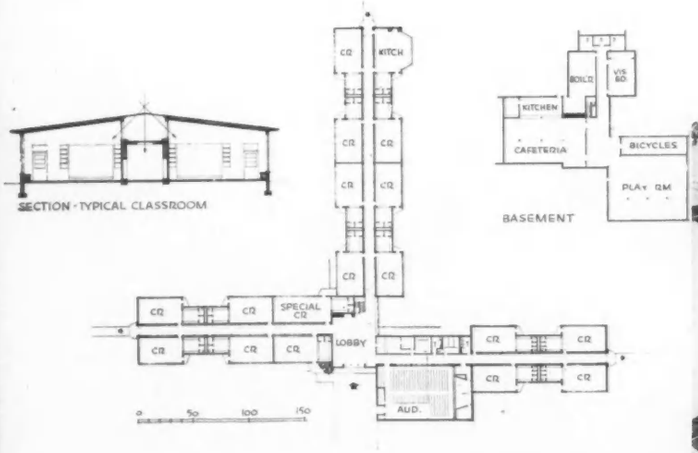
A "CENTRAL CORRIDOR" ONE-STORY SCHOOL

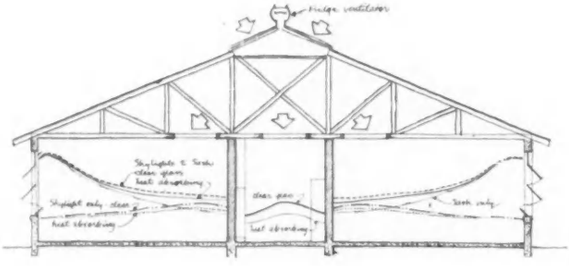
Elementary School, Perrysburg, Ohio

Britsch & Munger, Architects

PLANNED for a 14-acre tract adjacent to a 21-acre community recreation center, this warmly human school will have room to spread in, is worth study for its community facilities at the juncture of its T plan, its carefully worked out classroom with work alcove and individual toilet facilities. Like the Louisiana school shown on the opposite page, it has a central corridor topped by a skylight, and the ceiling is dropped to permit transom lights into the classrooms taking advantage of this overhead source. Because of the difference in climate it was necessary to specify heating coils for the dropped corridor roof slab to prevent formation of ice from the higher classroom roofs. Construction is delayed as a result of high prices.







DAYLIGHT IS BRIGHT ENOUGH EVERYWHERE IF WE ARE

By Charles D. Gibson

Field Representative, California Division of Schoolhouse Construction

LET no reader of this article suffer under the illusion that the authors have begun at the beginning. The space limitation and specialized subject field set for this effort will not permit a discussion of the basic educational and health considerations which provide most of the real concern we should have with school design problems. So, in true architectural practice tradition, let us begin our thinking on the finish side of the middle.

As background, at least three current publications, all short and to the point, merit the studious perusal of any architect:

A. "GUIDE FOR PLANNING SCHOOL PLANTS" (Tentative). Published by the National Council on Schoolhouse Construction 1946; copies available at $1.00 each from Dr. W. D. McClurkin, School of Administration, George Peabody College, Nashville, Tennessee.

B. "SPACE FOR TEACHING — AN APPROACH TO THE DESIGN FOR ELEMENTARY SCHOOLS FOR TEXAS." William W. Caudill, Bulletin of the Agricultural and Mechanical College

(*Continued on page 126*)

TOP LIGHTING AND VENTING IN THE SOUTH

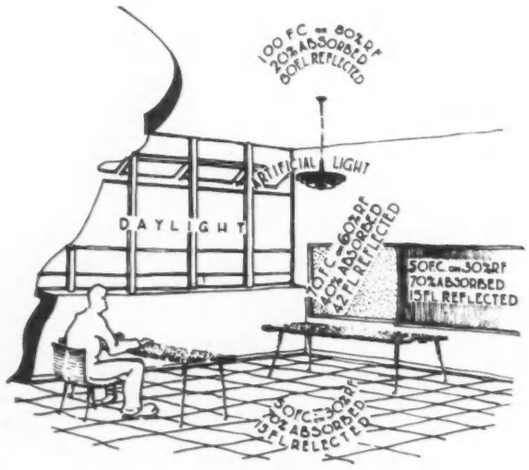
Belle Rose School, Assumption Parish, Louisiana

Bodman & Murrell, Architects

This very economical and ingenious scheme uses the attic as a combined venting and lighting plenum chamber, topped by a combined skylight and ridge ventilator. Light penetrates to the interior of the classrooms as shown: Dr. Hamon of U. S. Office of Education thought there was more than enough there. In future installations architects plan to use heat-absorbing glass. In a section where ventilation is highly important, the use of ventilation above the corridor is advantageous in eliminating the noise that is carried into classrooms from the corridor by the customary breeze sash above doors. The superintendent has reported "no leaks yet" though the skylight was installed, in very rainy country, in 1939

FC × RF = FL

FOOTCANDLES REFLECTION FACTOR FOOTLAMBERTS



The reflection factor of ceilings, walls, chalkboards, floor and equipment determines to a large extent the degree of brightness balance that can be attained in a classroom. The efficient utilization of light energy, whether from daylight or artificial sources is dependent upon the reflection factor of the surfaces on which it falls

of Texas; Vol. 12, No. 9, College Station, Texas; August 1941.

C. "YOU WANT TO BUILD A SCHOOL?" Charles Wesley Bursch and John Lyon Reid. Reinhold Publishing Corporation, New York.

First and foremost, let us examine our basic term DAYLIGHT. A major fallacy is that DAYLIGHT AND SUNSHINE are synonymous terms. Literature is sprinkled with "pie-charts" showing the amount of SUNSHINE enjoyed by various sections of the country during the months schools are in regular session. The entirely false implication of these astounding findings is that DAYLIGHT of sufficient degree to make a daylight-design school practical does not exist in several of our very populous regions. Pure poppy-cock!

California is not one glorious day of sunshine after another, nor are areas like Michigan populated by a mole-like race living in semi-darkness. California has its share of days without sunshine, and on the other hand, one of the best examples of school space daylighting we ever saw was in a Dearborn, Michigan school, sub-grade, dining-room, on the afternoon of April 16, 1947. It was a dark overcast day with morning snowfall and afternoon gloom. That cafeteria dining-room was lighted by means of a light well and a flat dome-shaped skylight area. We measured *six-hundred footcandles* over a large number of table tops while the brightness-difference between a piece of white paper on a table and the brightest area of skylight must have been well within a one to two ratio. But in the academic rooms of this school where most severe seeing tasks were constantly being carried out, one was — relatively speaking — lucky to be able to see a moving form.

The authors spent the entire, miserable month of April, 1947, touring the State of Michigan. Although we traveled through storm and floods, we never recorded less than 250 footcandles at 9:00 A.M. through the windshield of the car. The section of a "sunshine pie-chart" used to illustrate these conditions would have been as black as ink could make it, BUT — there was DAYLIGHT and lots of it — every day.

A certain degree of overcast gray sky presents a much more desirable and diffused daylight source than does a Mediterranean-blue sky with extremely strong and directional sunshine.

Intelligent lighting men have insisted that a good indirect lighting job featuring QUALITY instead of quantity was our best bet for schools. But the quality story was too often forgotten and there was a spree of more footcandles and still more. Too many bare lamp and improperly shielded lamp installations popped up. Like sunshine, they certainly were brighter, but that's all. Think of the children's eyes in the glare, to say nothing of the initial and maintenance expenses.

Some lighting propaganda has tended to divide the consideration of any given space-lighting problem into two separate and distinct parts — namely "natural light and artificial light," treated as two different phenomena, each operating according to its own private set of rules. Such decidedly is not the case. Daylight and ANY kind of artificial light source are subject to the same brightness and brightness-difference limitations when used in spaces where critical seeing tasks are performed.

It must be reasonable to assume that the same daylight that serves industry so adequately in ALL see-

tions of the country could be admitted into the schoolrooms of the nation with even more striking results.

Another major fallacy in the thinking of many about this subject is that if we control sunshine we have, by the same device, controlled daylight. Daylight control goes far beyond sunshine control in both theory and practice. *SKY BRIGHTNESS* and not sun-brightness, is the factor calling for attention and control if daylight is to become a positive factor in illuminating interiors in which critical seeing tasks are performed. Again, may we respectfully refer you to publication "A," and to the diagrams here shown.

For some definitions of basic terms we quote from reference "A."

"The footcandle is the unit by which we measure light intensity. Technically, the footcandle is the illumination produced at a surface, all points of which are at a distance of one foot from a uniform point source of one candle. The quantity of light falling upon a given surface may be measured in terms of fractions or number of footcandles. This unit of light quantity is measured with a footcandle meter. The footcandle is one of the basic factors in conditioning the environment for comfortable and efficient seeing, but it must be evaluated only in its relationships with other basic factors if it is to be weighed properly in consideration of this problem.

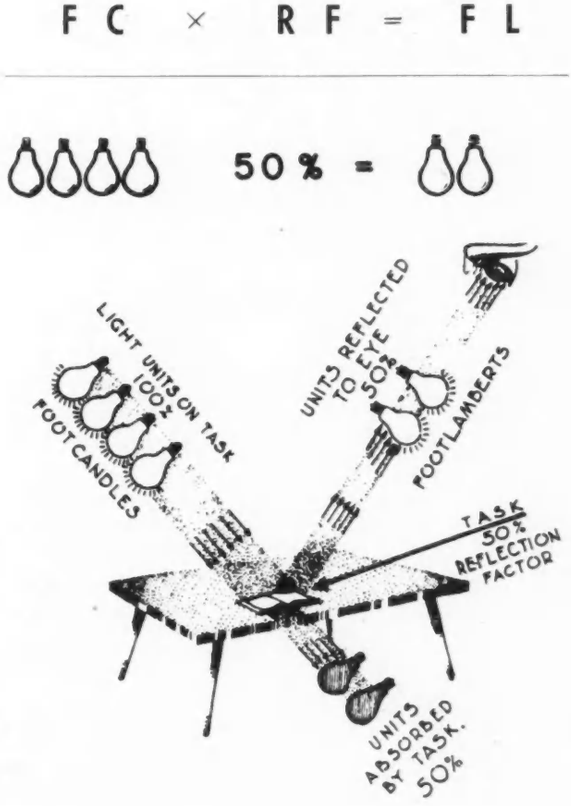
"Reflection factor is another of the basic elements involved in this problem, and is a full partner with footcandles, since surfaces of opaque objects are made visible only by reflected light. Reflection factor is expressed as the percentage of the total amount of light falling upon a surface which is reflected by that surface. This reflected light produces brightness.

"Brightness is the luminous intensity of any surface. Brightness may be created either by reflection or direct transmission of light.

"The footlambert and candles per square inch are the two commonly used units of brightness. Candles per square inch is the unit usually employed to measure the brightness of a source of light, such as a lamp or a light fixture. The footlambert is the unit used to measure the brightness of other surfaces. The average brightness of any reflecting surface in footlamberts is the product of the illumination in footcandles by the reflection factor of the surface. The footlambert, and not the footcandle, must be given prime consideration in the conditioning of the environment for visual comfort and efficiency.

"For the sake of simplicity, and because brightness comparisons are to be made between surfaces 'reflecting' brightness and surfaces 'emitting' brightness, the one term footlambert will be used for the unit of brightness in this Guide. Candles per square inch are easily transposed into footlamberts, since a brightness of one candle per square inch is equal to 452 footlamberts.

"Brightness-difference usually is discussed in the literature and research under two common brightness terms. The term brightness-contrast is used when the brightness-difference of the focal subject and its background is being discussed; for example, the brightness-contrast between the black ink and the white paper



The light unit which activates the visual process is the footlambert. The task indicated above becomes visible because of reflected brightness. This reflected brightness is the product of the footcandle intensity and the reflection factor of the task. The footlambert, then, rather than the footcandle becomes the prize factor to consider in conditioning an environment for visual comfort and efficiency because it is the reflected brightness that we see and not the light falling upon the task

used in this book. The term brightness-ratio is used when the discussion of brightness-difference deals with the brightness of the central field as compared with brightnesses in the surrounding and peripheral fields. Brightness-contrasts and brightness-ratios often are confused in the literature and in discussions; therefore, this Guide will use only the term brightness-difference to express the difference in brightness between any surfaces falling anywhere within the total visual field and will point out where this brightness-difference should be high and where it should be low.

"Brightness-balance is the key to visual comfort and efficiency. Brightness-balance is controlled by the brightness-differences that are maintained within the total visual field. Acceptable brightness-balance can be established in a visual environment where critical seeing is done, if the brightness-differences within the central field are kept as great as possible while the brightness-differences between the central field and the brightness found in the surrounding and peripheral fields are kept as small as possible."

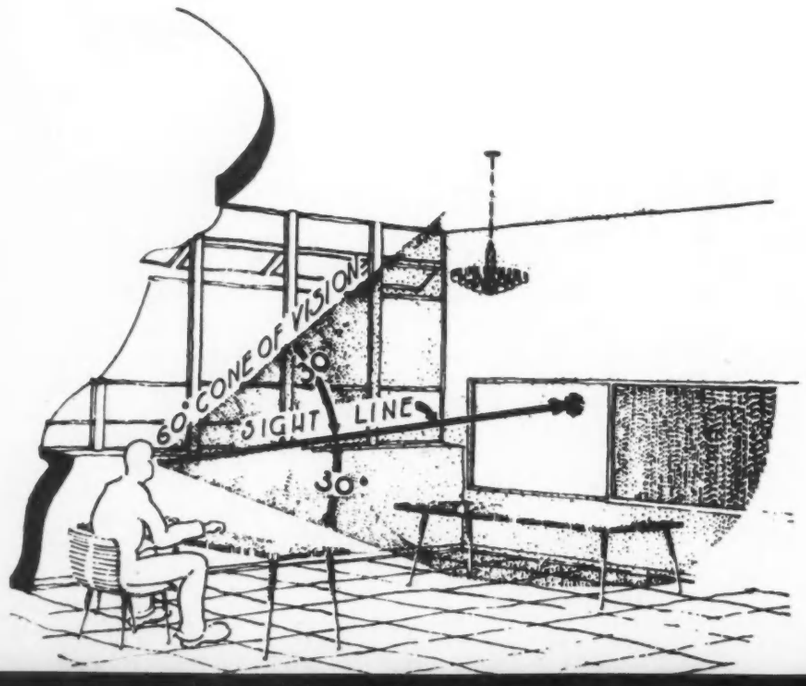
When the 49'ers came west to California, they brought with them their Eastern concepts of a schoolhouse. The Little Red Schoolhouse became a common sight in the rural areas. When metropolitan centers arose from the gold dust, there arose with them school buildings which were massive, monumental, institutionalized structures.

Just short of a hundred years have past since these first immigrant-inspired schoolhouses were built in California. Through all those years, architects have been following in their forefathers' blueprints so effectively that today all we can truthfully say is that only recently a new schoolhousing "trend" has been developed in the Golden State. In spite of this new movement or trend, there still are millions and millions of dollars worth of schoolhousing NOW being designed and constructed in California which are 25 years old in concept and are outmoded before they leave the drafting boards! The sad fact remains that at least a majority of school buildings in California today are woefully inadequate either structurally or from the standpoint of housing a present day educational program.

A most comprehensive presentation of the current lighting trend was reported in the ARCHITECTURAL RECORD by Douglas Haskell in the May, 1944, issue's "16 Ways of Daylighting a Classroom." We will make no attempt to duplicate any of Mr. Haskell's work but rather we will report on further California progress and what school design advances are being made in Michigan. Some overlapping with Mr. Haskell's story will be necessary for the sake of continuity.

Daylight design in California had for its first goals more footcandles of light, better distribution of footcandles available from daylight, and the elimination of the problem of sun-control by building orientation. First solutions used an unilateral light source with higher and more continuous unshielded window areas oriented to the north. The sloping ceiling was introduced at this stage. Building sections using north-oriented window areas supplemented by north-oriented clerestory glass followed.

The next developments still sought more footcandles of light, better daylight footcandle distribution; but used building sections designed with large window areas oriented to the north and supplemented by transom-type windows on the south wall. This south exposed glass was protected *from the sun* by corridor roofs or



It is apparent from the illustration at left that the 60° cones include the major portion of the classroom even when the students are facing directly forward. This means that the entire classroom including the windows, lighting fixtures, ceiling, walls, floors, furniture and equipment should be conditioned to meet the requirements of brightness-difference recommended for the surrounding field

wooden louvers, either inside or outside the windows.

The majority of the building sections illustrated by Haskell in 1944 fell within these first two concepts. These 1944 "trends" now have snowballed into a full-fledged "movement" in school architecture in California and are fast becoming significant in other sections of the United States.

A most important change in our thinking has taken place since 1944. Instead of seeking greater quantities and better distribution of daylight footcandles along with sun-control, we now have advanced to a much sounder objective. *Today, daylight design must be evaluated by the principles of brightness-balance and sky-brightness control.* There are very few architects who have made this transition in thinking.

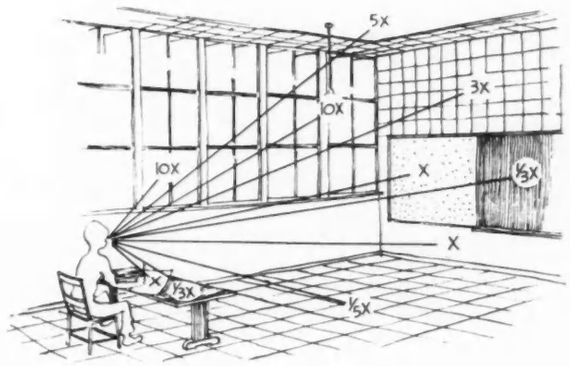
There have been many new multi-source daylight classroom building sections developed since 1944 in California and in other sections of the United States. All but a very few, however, follow some modification of straight bi-lateral, clerestory or monitor lighting systems. The results of new design techniques in large scale school building projects can be made best by comparing brightness readings from these units with brightness readings taken in more conventional bi-laterally lighted spaces.

The principles of daylight design are destined to be accepted wherever school plant architecture is practiced. The impact of this movement will cause a complete re-evaluation of present concepts of school plant design. Many of the design changes directly due to the better use of daylight as the primary light source for schools already are apparent.

Educational concepts and practices are in a near constant state of change. Therefore we must plan against educational obsolescence just as carefully as we plan against structural obsolescence.

School plants now emerging from the daylight design movement are resolving the architectural dilemma caused by the necessity of planning for both the known and unknown. One-story, low center-of-gravity buildings with single and double loaded corridors are now popular. When local conditions call for two-story buildings, they are beginning to appear with single-loaded corridors, permitting the advantages of multi-source daylighting.

These types of one- and two-story buildings make it possible for educators and architects to re-study traditional space grouping in terms of present and future program needs. Primary and elementary school plants can be laid out in a "finger plan" which permits simple traffic controls and easy, direct access to recreational, assembly, feeding and administrative areas. Building



BRIGHTNESS GOALS

X = Task Brightness
10X = Highest Permissible Brightness
1/5 X = Lowest Permissible Brightness

"blocks" made possible by the sawtooth design permit the semi-isolation of small groups of students thus eliminating to a great degree undesirable "mass pressures" on young children.

On the secondary school level these new type buildings make possible much better coordination of both academic and special room space while at the same time providing for decentralized and better controlled student traffic. The proper planning and location of building "strips" has made possible the development of the six-year high school in rural or small town areas. The great objection to such a program by both parents and educators has been the negative effects of having seventh grade students thrown together willy-nilly with twelfth grade students. All students have the advantages of a more comprehensive educational program, more specialized teaching staff and better physical facilities and at the same time retain their identity within junior and senior groups, each group becoming a social entity. Minimum cross traffic of groups is necessary and class scheduling techniques make possible the fuller use of expensive and specialized equipment and space.

Daylight design school buildings of one or two stories solve the weighty problem of easy plant expansion. Traditional school design created large, massive structures many of which defy limited additions. The simple strip-type buildings with all corridors running through to outside walls, on the other hand lend themselves functionally and architecturally to even one classroom additions. All services for electricity, heating, sewage, etc., are sized to permit additional loads.

One of the great advantages of this modern building

is that it lends itself gracefully and inexpensively to "Contractions." The old solution to the problem of high costs was to go over the plans and "take out all the trimmings" which meant stripping out educational facilities and/or a poorer structure. Today, we simply lop off entire units of space — two or ten classroom units — thus still permitting the construction of a complete, efficient, if smaller, *school plant.*

Modern structures may retain their refinements and educational usefulness because it is so simple to "expand or contract" building units to meet the financial ability of the school district.

The word *"FLEXIBILITY"* has been greatly abused. However, it still best describes a prime requirement of a school plant today if it is to meet adequately the school program of tomorrow.

The one definite and measurable factor in planning school spaces for today's and tomorrow's educational program is FLOOR AREA PER STUDENT. The certain trend in educational planning today is toward a "laboratory-type program" of instruction on all grade levels and in nearly every subject field. This means that if schools are to be planned to meet BOTH today's and tomorrow's needs, they must lend themselves readily to space re-arrangement. Learning by doing, which is the "laboratory technique," will require more floor area per student than the currently dominant technique of trying to learn by listening and recitation.

New school design makes possible floor area re-arrangement to implement the educational program. Many of our modern schools are being designed for rigid-frame or bent-type construction. This takes bearing loads off the regular walls enabling the architect to design continuous multi-source daylight areas. Modular structural units and moveable partitions coupled with the feature of small control areas for heating, lighting and ventilation systems make it possible to re-evaluate building space in terms of desirable educational programs rather than vice-versa. Multi-source daylight design has made practical wide and constant span buildings which lend themselves admirably to today's program and which will be indispensable to the educational program of the future.

The "square classroom," which has worked out so well in California with a 30- or 32-ft. span, is an education asset on all grade levels. On the elementary level it provides better grouped instructional spaces, better supervision, better audibility, and more free floor area. On the secondary level it gives these same advantages plus the advantage of a constant span building for both academic and laboratory subjects, thus allowing the uninhibited re-arrangement or re-assignment of building space as program changes may demand it.

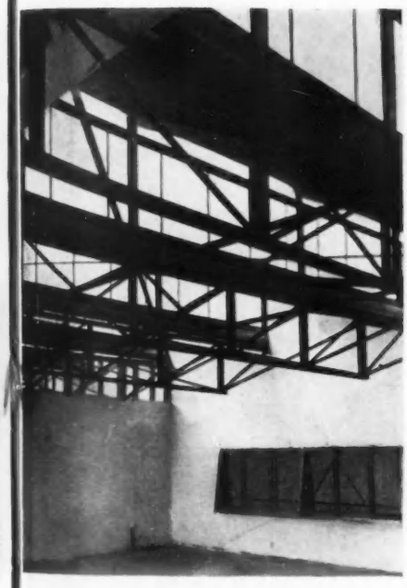
Recent advances in and acceptance of mechanical engineering developments have made the expansibility, the contractability and the flexibility of school buildings practical rather than visionary. The last ten years have seen radiant panel heating leave the experimental stage in this country and become the answer to decentralization of heat sources and controls. The need for mechanical ventilation, even in the most rigorous climates, is being seriously questioned and a swing toward window-gravity ventilation is gathering momentum. Multi-source daylight design has outmoded older switching patterns for artificial light sources. Fixtures now are being controlled in "crosswise" rather than "lengthwise" patterns in schoolrooms since we no longer have one daylight source and because the "crosswise" fixture-switching pattern lends itself admirably to the expanding or contraction of space usage.

Comments on General Daylight Design Movement

1. More intelligent study must be made by designers in order that they understand better the brightness goals toward which they should be working. (a) Brightness-balance instead of high footcandle levels. (b) No ONE way to achieve brightness-balance. Best daylight designs so far still fall short of goals we seek.
2. In new construction multi-sources of daylight offer more effective solutions than does the attempt to introduce daylight from one exposure only and redirect it by refraction or other means, to produce a more uniform level of illumination, and at the same time reduce sun and sky brightness.
   In new construction it is short sighted to design for unilateral lighting when multi-source construction offers much more effective solutions. Several suitable designs for multi-source construction will provide satisfactory brightness and footcandle levels, whereas comparable conditions can not even be approached by unilateral methods.
3. Daylight design will become a "movement" all over the country and will serve to change present school design concepts.
4. An endowed foundation free from any commercial interests should be set up to do research in the whole field of school plant design as a safeguard to our Nation's health and educational effectiveness.

Editor's Note: Practical obstacles have prevented showing a great many Michigan and California examples no less meritorious than those included, for example, in Michigan, new work by Warren S. Holmes Co., by Everle M. Smith Associates, Edwin E. Valentine; in California by H. L. Gogerty Associates, Dixon & Kline, Robert E. Alexander, Bamberger & Reid, and many others. As far as possible this work will be shown in succeeding issues

Offsetting of factory-type sawteeth was adopted to provide diaphragm for earthquake bracing



INDUSTRIAL IDEAS CAN RESHAPE SCHOOLS

Two Schools in San Bernardino, California

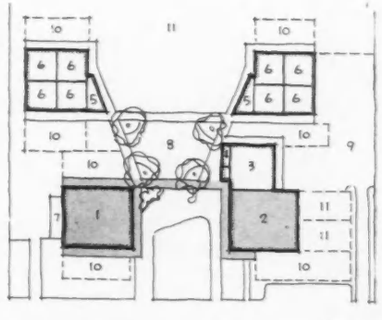
Jerome Armstrong, Architect; Henry F. Kimes, Superintendent

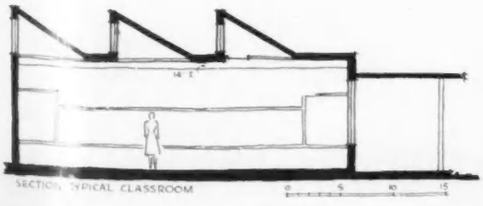
HIGHLY suggestive of the possibilities still ahead of us are these two California schools that adopt industrial sawtooth lighting outright (in addition to side windows for view). An important consequence has been the regrouping of classrooms into blocks of four, each 64 by 64 ft., with consequent sharing of interior partitions, elimination of corridors. (Not even the vaunted "finger plan" is an ultimate.) Construction is of a patented lightweight steel system which eliminates form work. The architect is fully aware that there is room for much further refinement but the top-lighting idea, which is also going forward elsewhere in California, is of high potentiality for the future.

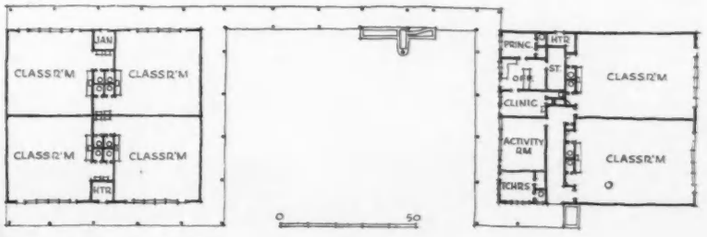
Drawings are all of the Pacific Avenue School; photographs of the Muscoy School, San Bernardino

PLOT PLAN LEGEND

1 & 2 Units Shown Below	7 Bicycle Storage
3 Multi-Purpose Room	8 Outdoor Eating Area
4 Kitchen	9 Service & Parking
5 Toilet Rooms	10 Outdoor Classrooms
6 Classrooms	11 Playground Area







Stewart & Skelton Photos

Barstow, Cal., High School

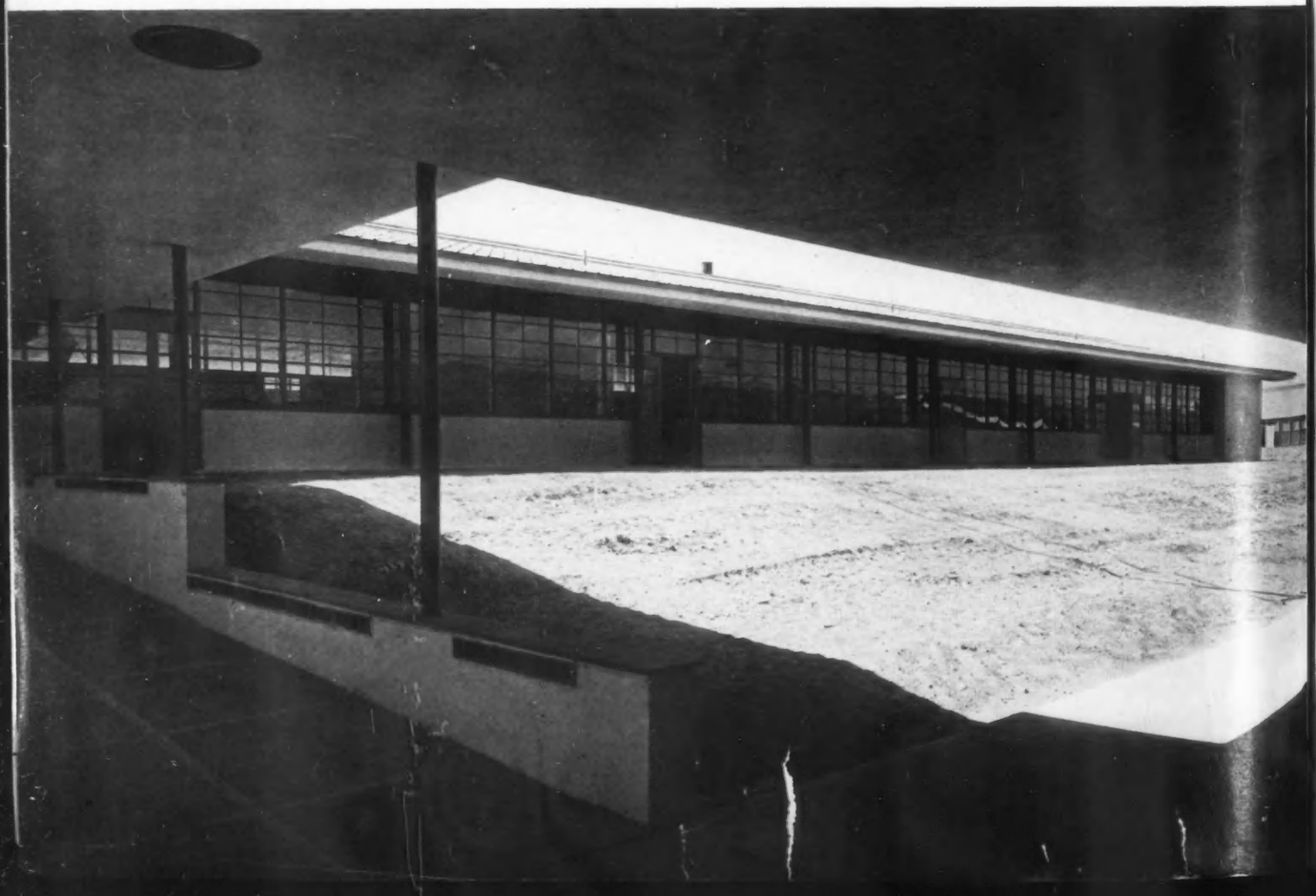
Franklin, Kump & Falk,

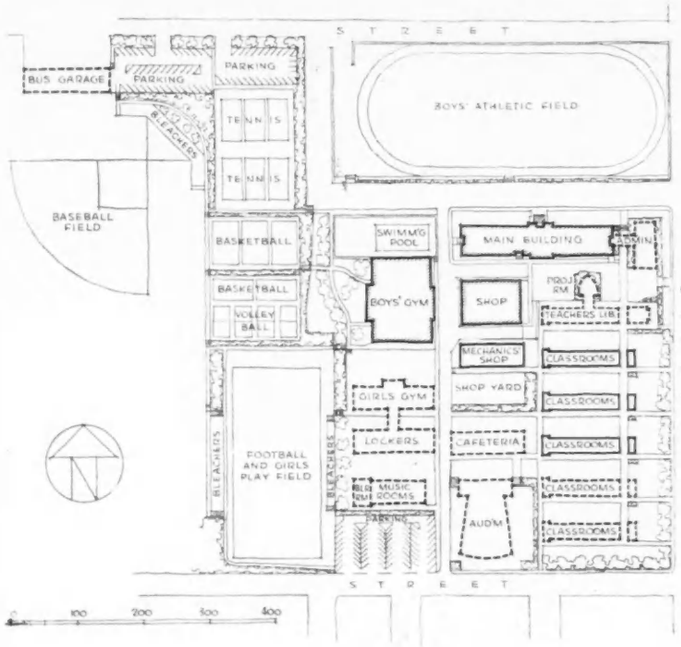
Architects-Engineers

TOP LIGHTED HIGH SCHOOL IN THE DESERT

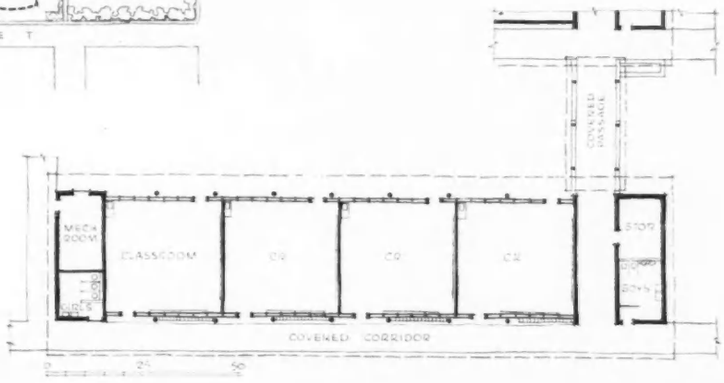
BARSTOW, trading center for a vast Mojave Desert area, lies about 60 miles east of Los Angeles, has brilliant sun reflected from sandy soil as the illustrations show. The assignment of the architects, after making a master plan for the existing high school, was to begin its expansion program as seen in the accompanying plan.

Once again they employed the top-lighted, low-lying, ridge-skylight form reported in the January RECORD in connection with a school at Laurel near San Francisco. The full-length skylight admitting daylight to the center of the rooms, made low scale possible; wide overhangs, charming in themselves, create the open corridors; the transverse passages add interest. Such a plan is flexible to build and manage.

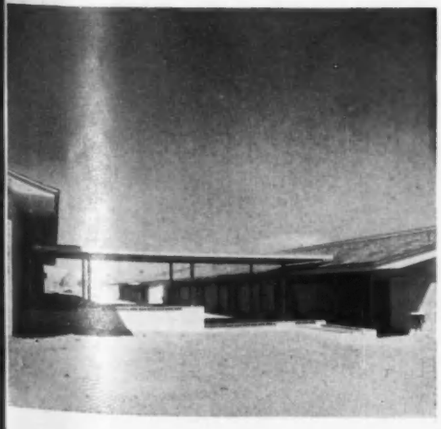


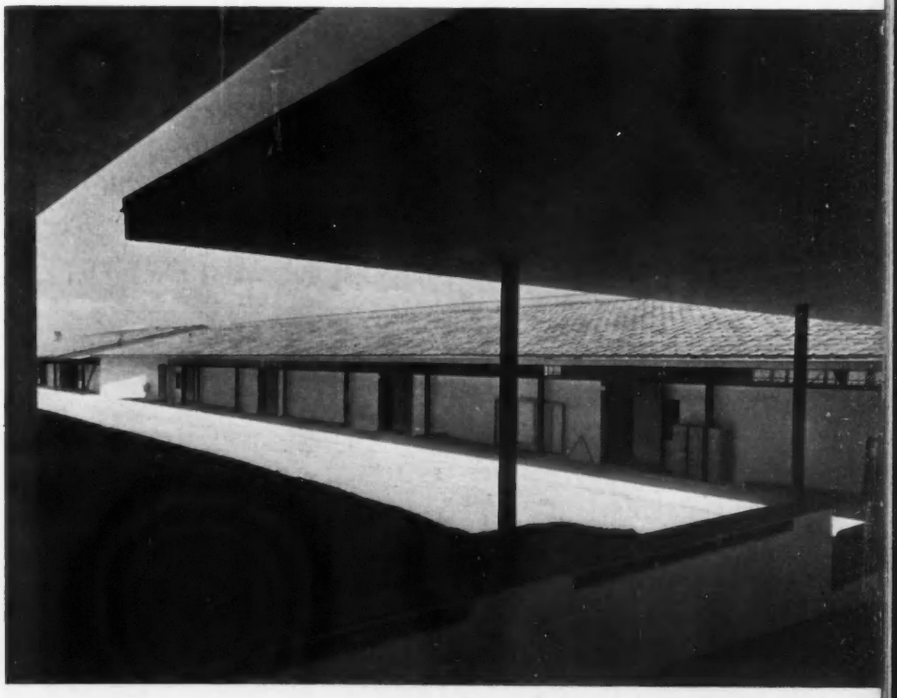


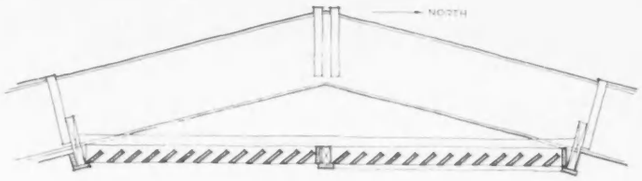
A fully-developed "finger-plan" school is easy for administrators to adapt to changing use. In the beginning it is natural to assign each wing or group of wings to a separate school group; but later, as groups shift in size, it is perfectly convenient to retain the basic zoning even though some wings are divided in two parts by the boundaries between zones

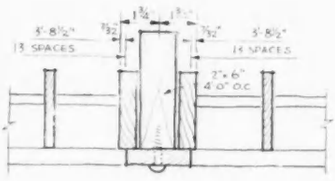


Only the three wings inked solidly in the plan were built in the first take, besides a mechanics' shop. Photographs show the system of connecting galleries



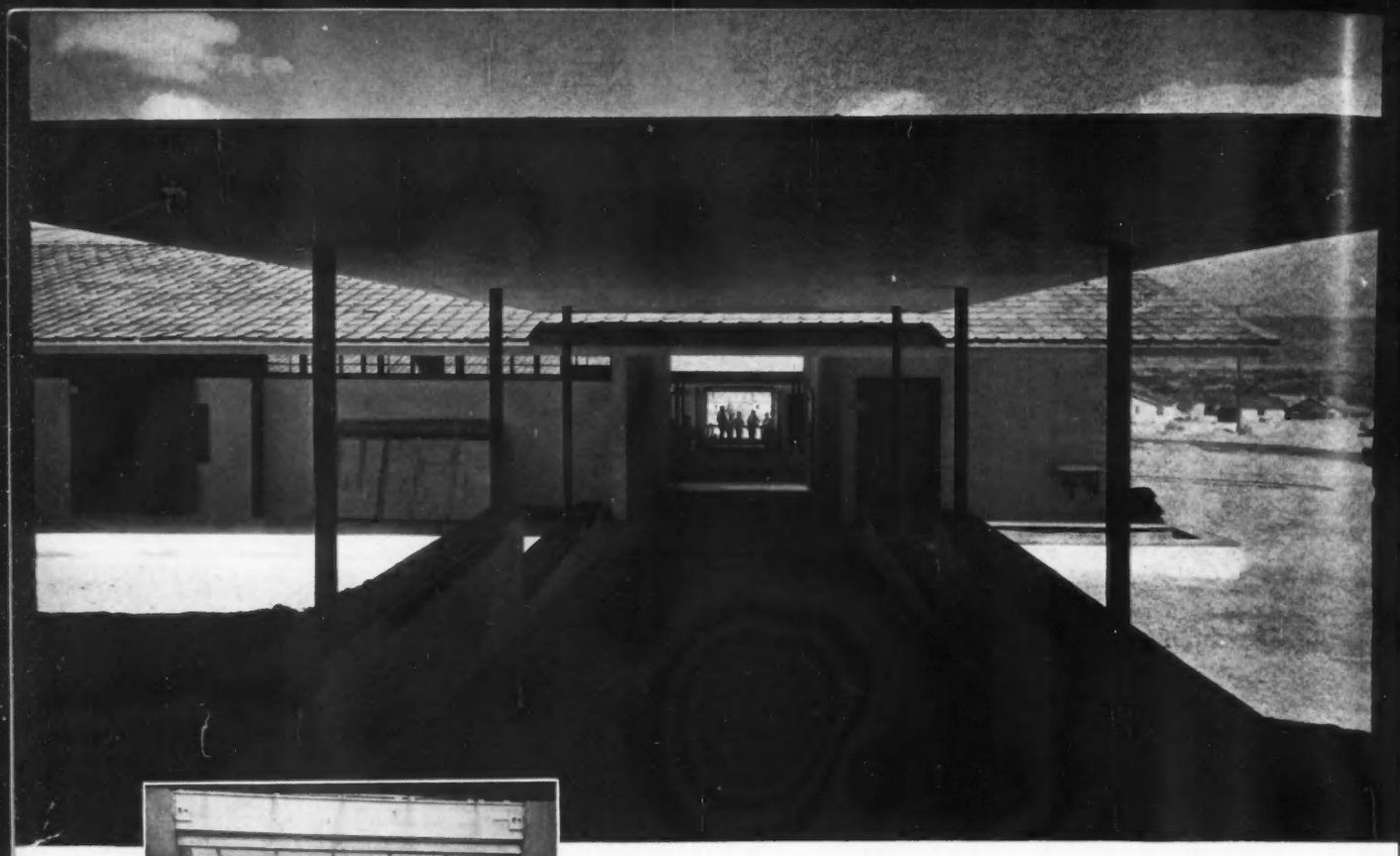






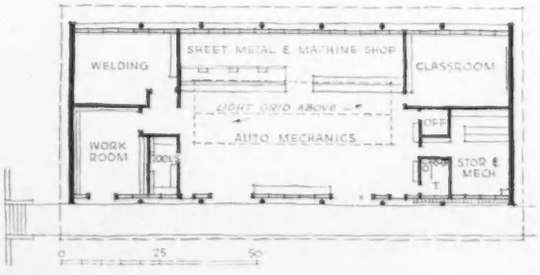
Full skylight detail was shown in ARCHITECTURAL RECORD *for January, 1947. The wooden egg-crate light baffle to cut off sky-glare is here changed to go horizontally instead of following the roof. Note that its vanes are sloped to stop direct sunlight from a high southern sun.*

Below: classroom interiors, looking toward the full-height north windows and again toward the transom lights under the corridor. As may be seen, the surroundings are brilliantly reflective on a sunlit day. Mr. Kump believes firmly in having all controls permanently built in, needing no adjustment by teachers



Stewart & Skelton

The idea that the best way to get daylight into the middle of a room is to let it right down in, direct from the sky, has a common-sense flavor, and the evidence is that it creates a school very superior to the average. Whether it will be the means of making the very best schools possible is yet to be fully tested by experience and adjustments. There are illuminating engineers who contend that considerable reflection will be needed to obtain the best spread and diffusion of top daylight admitted directly; they compare it to direct down light from illuminating fixtures. The very progressive record of the Kump firm indicates that although the Barstow High School is a highly pleasant place to work in and handsome to look at, it is one more step forward, not the end



Leslie Watts Photos

Barstow Elementary School, Cal.

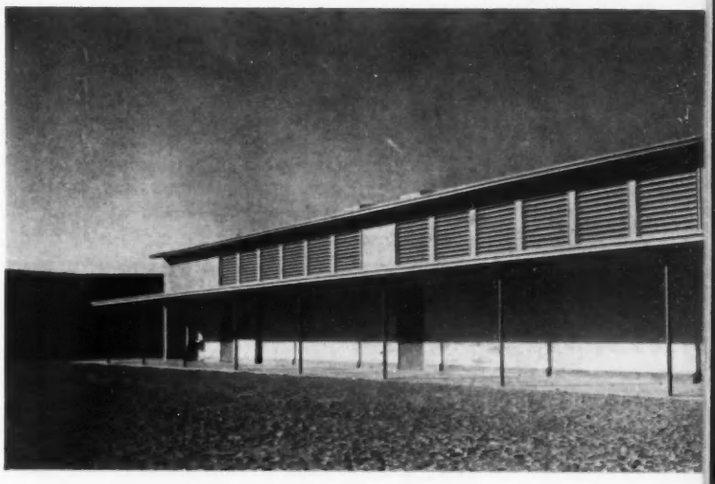
Kistner, Curtis & Wright

Architects and Engineers

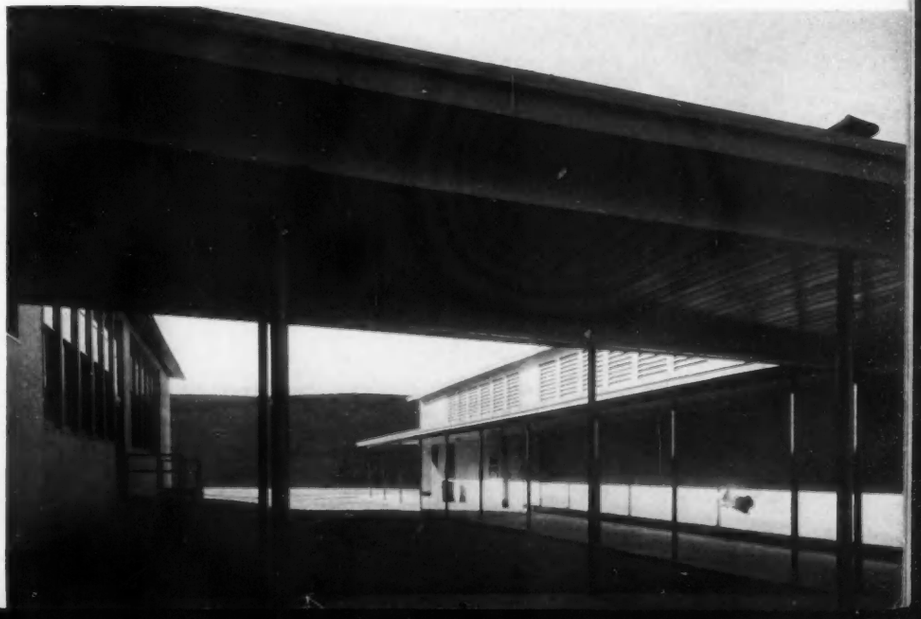
BILATERAL LIGHTING WITH HIGH CEILING

BUILT in the same city as the Barstow High School seen on previous pages, this elementary school stands in sharp contrast. Its ceilings, 14 ft. high, make it look as if it were actually two stories instead of one. This great height was no obstacle functionally, but perhaps a help in a hot region. The daylighting theory was that light should be admitted bilaterally through tall north windows and shielded south transoms, the ceiling to serve not as source but as reflector.

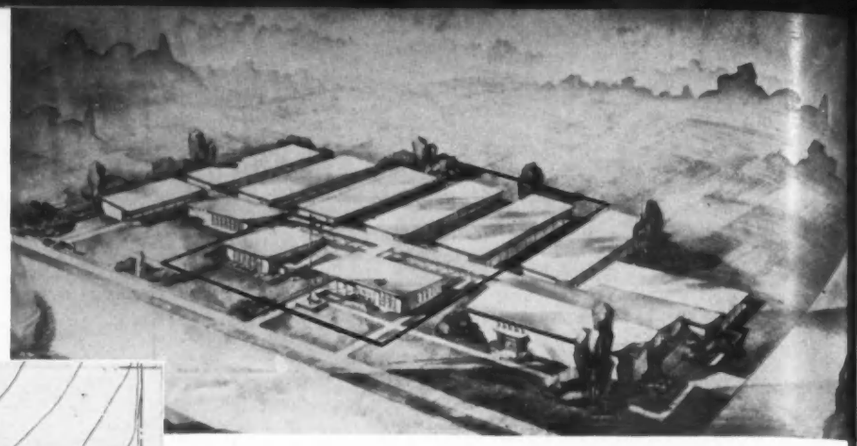
Although the great height would be objected to in northern climates and although there are some who think it results in scale somewhat imposing to small children, there is no question that the combined strength of illumination and the even brightness distribution, as shown in the table, is no less than amazing.

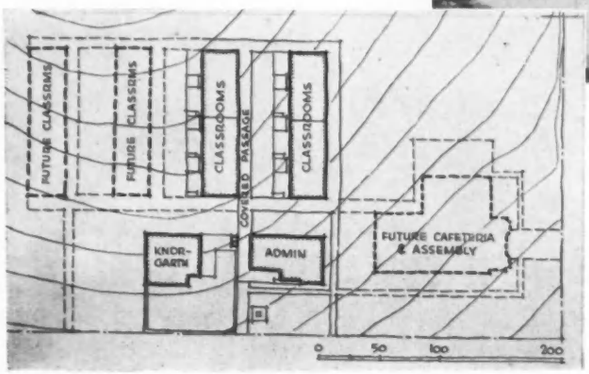


SURFACE	Foot Lambert Reading	Ratio of Task to Surface
Task	90	-
Desk Top	20	2.5:1
Floor	16	5.6:1
Writing Panel	22	4.1:1
Tackboard	38	2.4:1
Wall	200	1:22
Ceiling	200	1:2.2
North Sky	2700	1:30
Clerestory Window	650	1:7.3



Kistner, Curtis & Wright
Architects and Engineers





BILATERAL LIGHTING WITH IMPORTANT IMPROVEMENTS

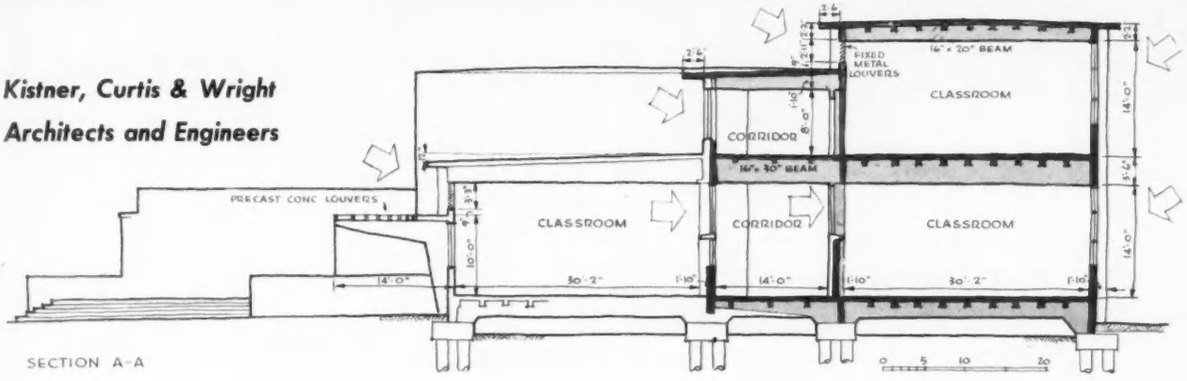
Bella Vista Elementary School, Montebello, Cal.

PROGRESS in daylighting design depends not only on wholly novel methods but also on continual refinements in existing ones. Here we see Mr. Wright, in a current project of later date than the Barstow Elementary School on the preceding page, managing to get more light from the south, through transom lights instead of clerestory lights, and still effectively shade it.

First, the corridor roof has been integrated with the classroom roof in a single high slab (as Kump has previously done). The result is the possibility of a lower window sill and greater window area (see ink drawing adjoining the interior view of the existing Barstow school). Then the shading louvers, to cut off direct south sun and direct view of the southern sky glare, have been attached to the *posts of the exterior corridor* instead of the windows themselves. (See detail.) In general, it is a good principle to put sun-and-glare cutoff devices at the greatest possible distance away, to secure nice light diffusion. Tree screens, where possible, are admirable to the purpose.

Leslie Watts Photo

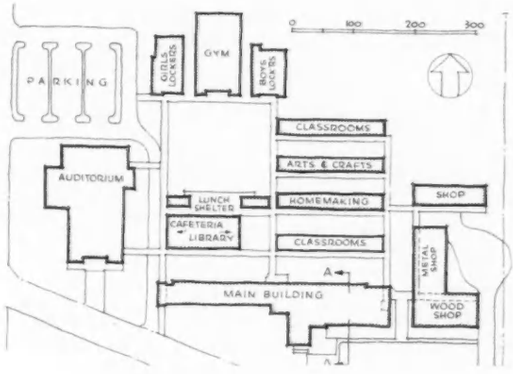
Kistner, Curtis & Wright
Architects and Engineers



SECTION A-A

TWO-STORY BILATERAL DAYLIGHTING AT LAST

Rosemead High School, California



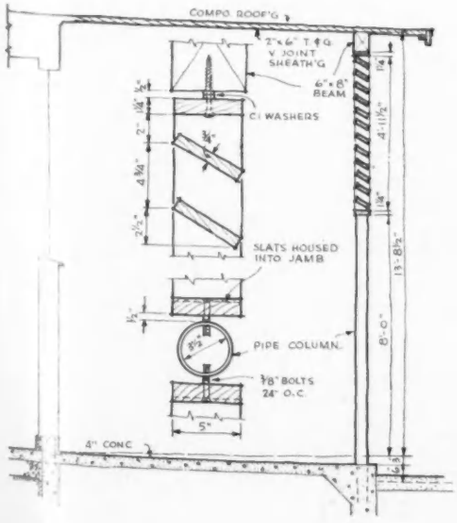
Now under construction, this school puts to rest the idea that buildings of more than one story are restricted to getting light into classrooms from one side only. As seen in the cross-section at the top of the page, throughout most of its length the school has side-corridors on both floors, which permit transom lights on the south side on the *first* floor, and clerestory lights on the *second* floor.

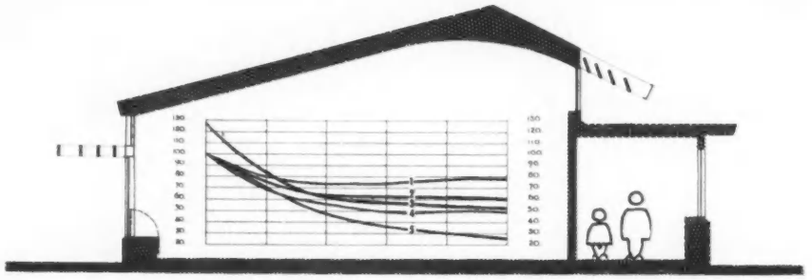
This system of side-corridors on both floors had been foreshadowed in architectural literature (see "16 Ways of Daylighting Classrooms," ARCHITECTURAL RECORD, May, 1944, page 77) but, as architects know only too well, there can be a lag between having a conception and getting the chance to execute it.

Although this use of single-loaded corridors, in the interest of easier better daylighting, involves the use of more land than double-loaded corridors, the increase is held down by the fact that square classrooms are made practical. These fatten the building and shorten its length in comparison with rectangular rooms of equal size. There comes into existence a new type of school, intermediate between the wide-ranging one-story affair and the densely developed two-story school with central corridor. It overcomes one real disadvantage of the single-story type — that the long distances make for real difficulty in administration. In a high school there is less to be gained educationally by having all classrooms on the ground than there is in an elementary school; moreover the older children are better able to take care of themselves on stairs.

The structural system of the Rosemead School is one of transverse concrete frames every 15 feet. It is an inexpensive system, and the school was bid in, in 1947, at a cost of only $9 a square foot. The interior partitioning of the school is independent of these frames, so that changes are possible with ease at any time. A slightly unsymmetrical appearance where frames show in the room is a small price to pay for the substantial cost savings.

The school will be fully published on completion.





Elementary School,

Clarksville, New York

PAINSTAKING RESEARCH SHAPED THIS NEW YORK SCHO

Henry L. Blatner, Architect

George Teeling, Mechanical Engineer

THE architect got the job on basis of *not* being a school specialist, being fresh. Early in his 2-year research, he submitted the best Western school section he could find, got approval by school board and State, remained dissatisfied nevertheless.

He then set up a model in correct outdoor conditions in his front yard. Scale was 1:5 for convenient use of glass block. An interested utility company lent two footcandle meters correctly calibrated for simultaneous outdoor and indoor readings, and a *footlambert meter for brightness readings.*

First test was on conventional Western model having shed roof sloping upward from north windows (clear glass, unshielded) to south clerestory (glass block, unshaded) over side corridor. *Conclusion:* ceiling too bright at high point. Unshielded glass block too bright.

Second main step: ceiling bent at high point to its present shape (see above). Glass-block clerestory shielded by solid overhang. Clear unshielded windows to north. *Result:* light distribution good, ceiling brightness within desired range, brightness of evergreen trees 40 ft. away, seen through north windows, was well within range of interior brightness in all parts of room under all light conditions. North sky visible above trees was too bright. *Conclusion:* sky view must be cut off in all cases, and more light obtained through clerestory.

Third main step: sky screen added at north 6 ft. 8 in. above floor, with glass block above (see section above). This, in connection with evergreen tree screen to be planted 40 ft. from north wall of building as constructed, would effectively eliminate all sky view to the north. Louvers replace solid overhang over glass block clerestory. *Result:* light curve flattened at north wall. Light curve at clerestory raised approximately 20 per cent. *Conclusions:* flattening of curve at north wall considered an advantage; louvers needed at southern clerestory.

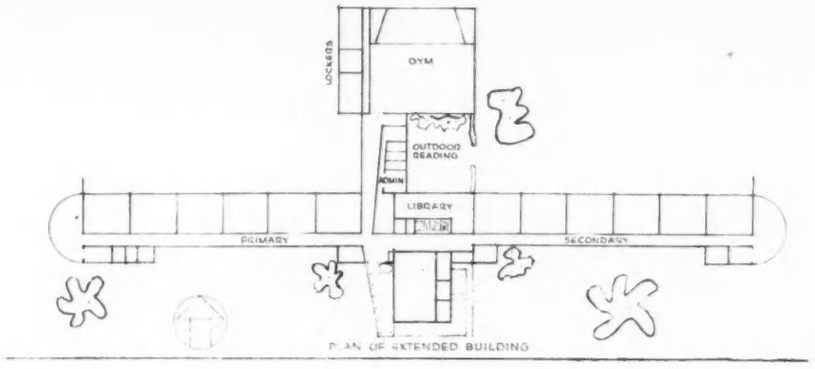
When clerestory was blocked out to test the value of bilateral lighting at this point, footcandle reading near south wall dropped from 60 to 26 fc. in typical test.

Fourth, final main step: clear glass replaces glass block in clerestory. One louver more than was required to keep sun from striking glass block was added; purpose, to cut off all view of very bright south sky. Inside of louvers painted dark enough to be held within 10:1 brightness range. Glass block retained above louvered sky screen over clear glass windows. *Result:* light level at south wall raised a great deal; addition of one louver plus darker paint reduced level only very slightly. Clear glass clerestory made room seem more spacious and interesting. *Conclusions:* this design adopted.

Summary of advantages in final design

1. Very flat, high, light curve across room.
2. Brightness differences held within 10:1 ratio in any direction at all times.*
3. Generous view outdoors — feeling of spaciousness.
4. No adjustable interior controls to be watched, operated, or maintained.**
5. No adjustments needed of exterior controls.
6. Warm south light in all rooms at all times (reflected sunlight).
7. No solar heat problems in Spring or Fall.

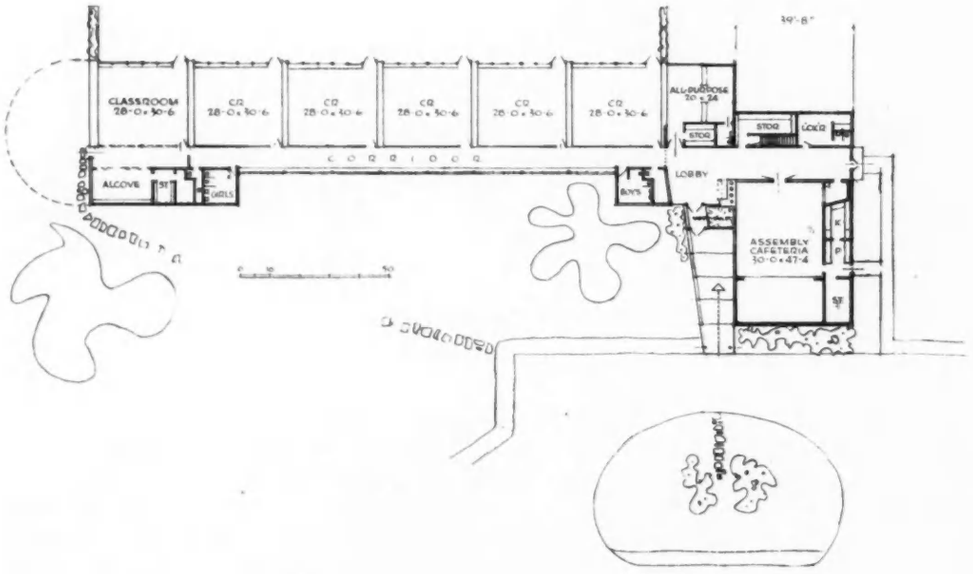
* *Tilting cabinet tops at north wall cut off view of any snow on ground. Snow raises illumination level but with brightness range little affected.*
** *Drapes are installed to darken rooms for visual education only.*

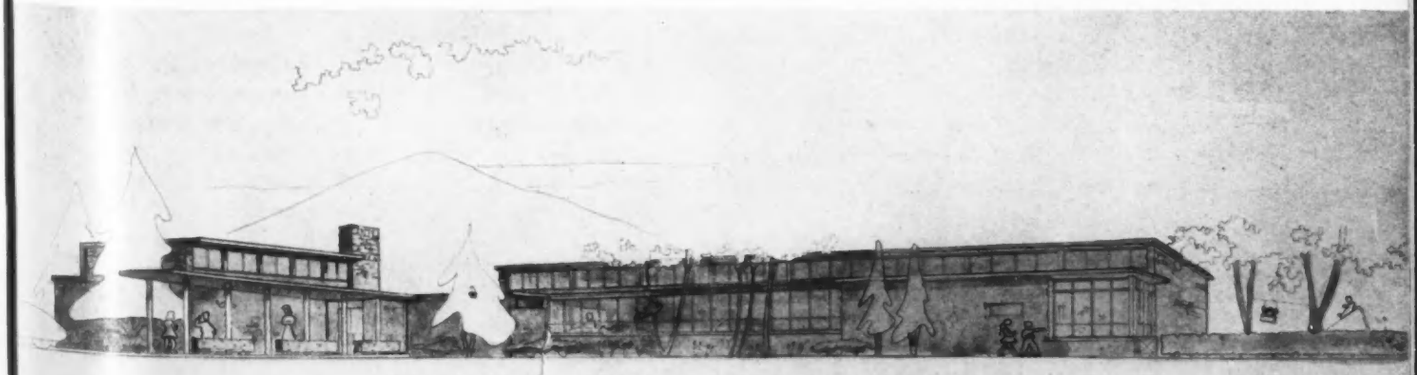


PLAN OF EXTENDED BUILDING

SCHOOL

An evergreen tree screen, 40 ft. to the north, is an integral part of the design of this school, now out for bids. Clarksville is a mountain community near Albany, N. Y. Only the western end of the building is scheduled for immediate construction (below). Sketch gives general effect though considerable changes have since been introduced as described in the text. Structural system is to be light steel welded frames and masonry. Tree screen is a device for interior brightness control, which was thoroughly studied and reported in the accompanying text



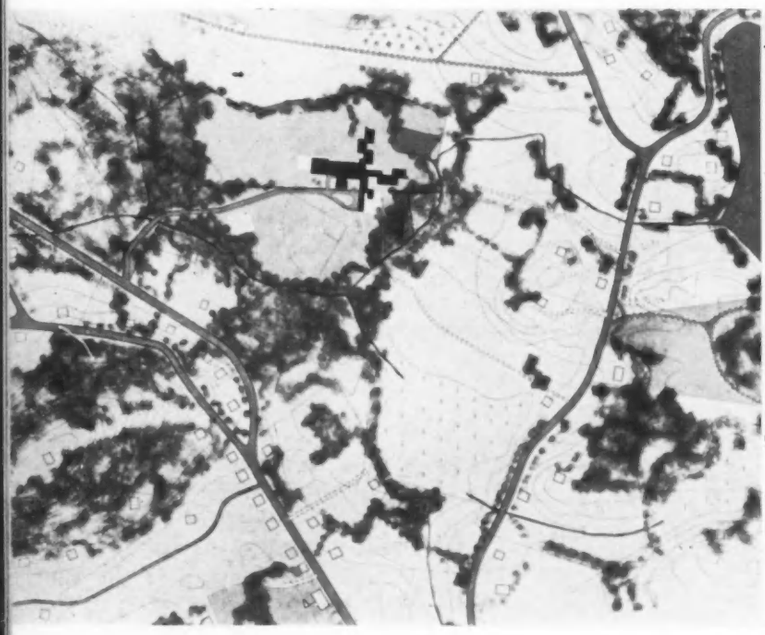


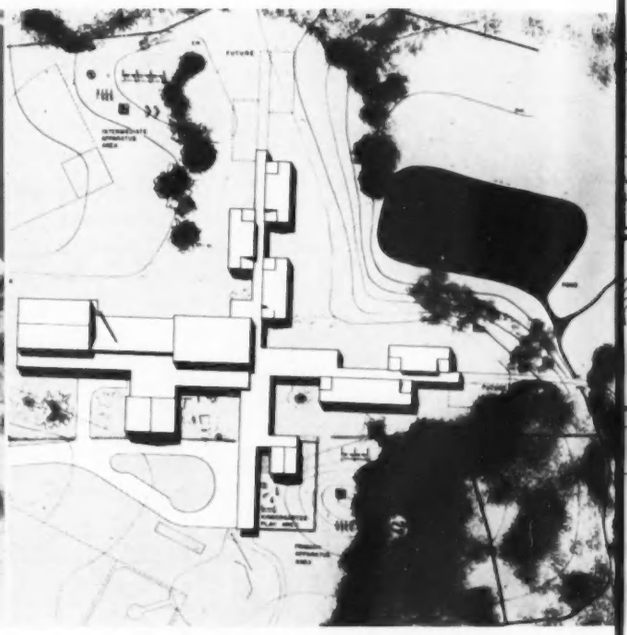
PERSPECTIVE VIEW FROM STREET

NEW ENGLAND SCHOOL THOUGHTFULLY PLANNED

Proposed Elementary Community School for Lincoln, Mass.

Anderson & Beckwith, Architects



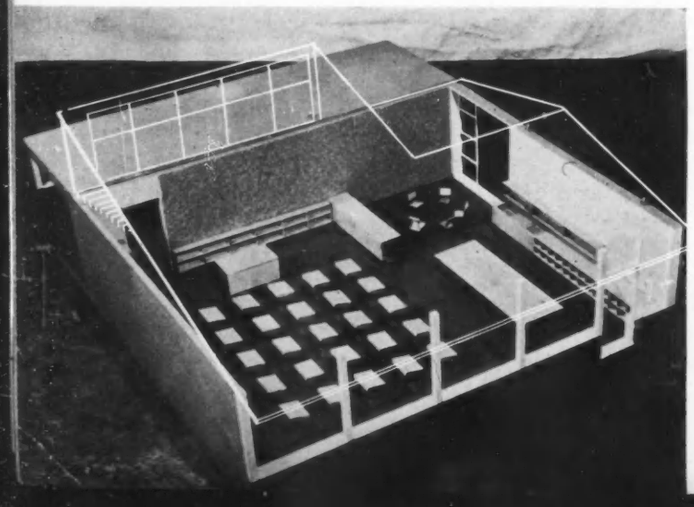


ALTHOUGH this school project for a highly educated community in the Boston suburbs has a brilliantly ingenious daylighting method, its real distinction lies in its thoughtful planning and clean all-around handling.

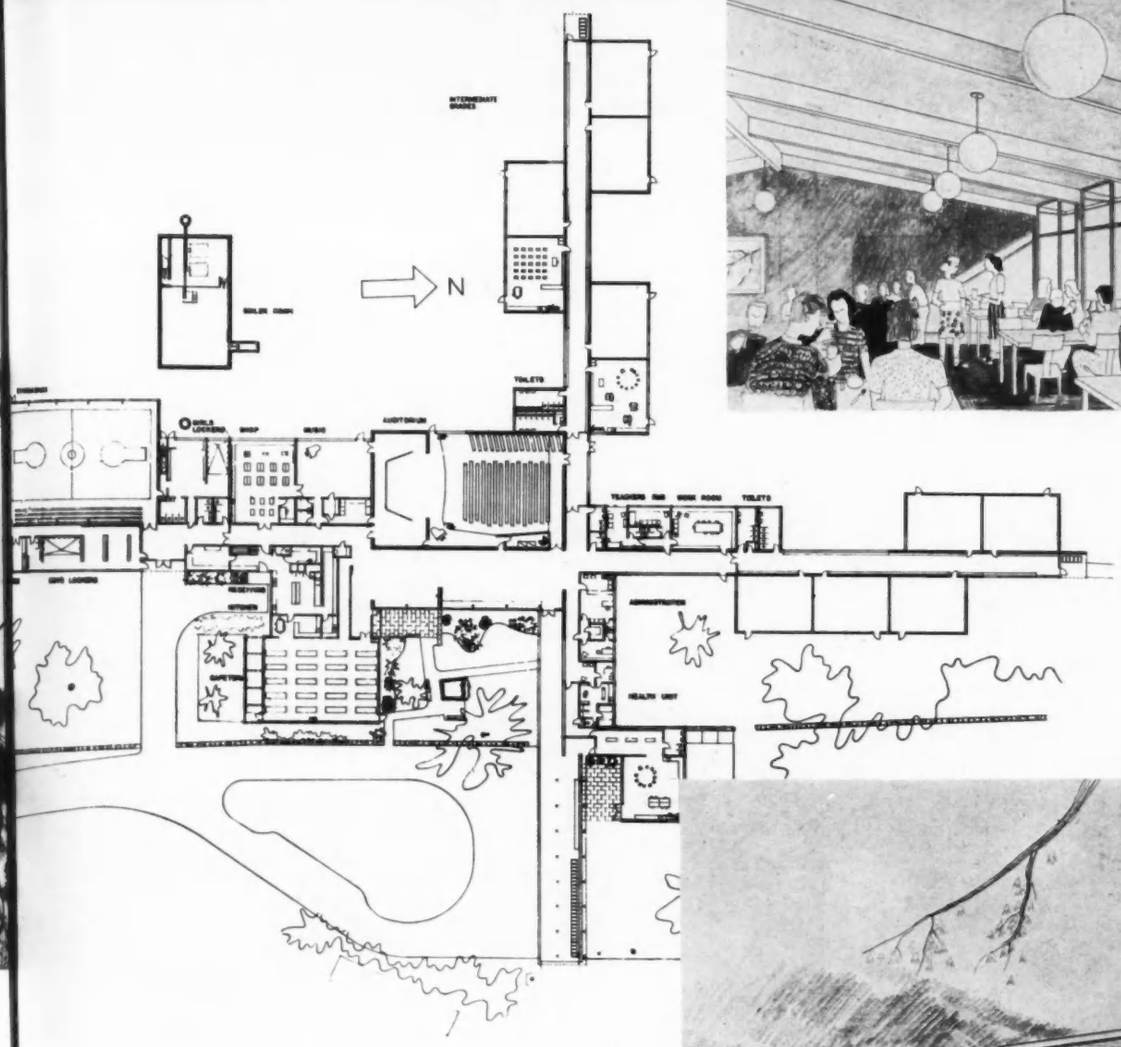
A cross-shaped general plan of this sort is highly useful in dividing off the surrounding land into well-defined playing areas for different ages and sports; on the interior it favors zoned planning by wings and easy access; and yet the really successful operation of such a plan depends on making classroom lighting practical under quite diverse conditions of orientation.

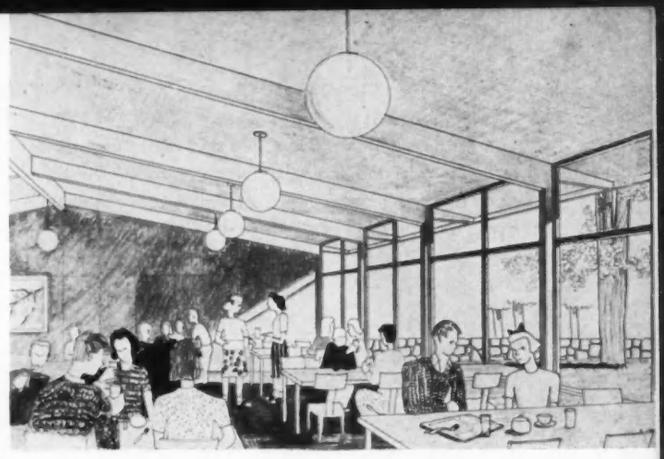
In the ramifying, one-story-high building, each kind of activity has a wing to itself: there are kindergarten, primary, intermediate wings and a wing for community facilities.

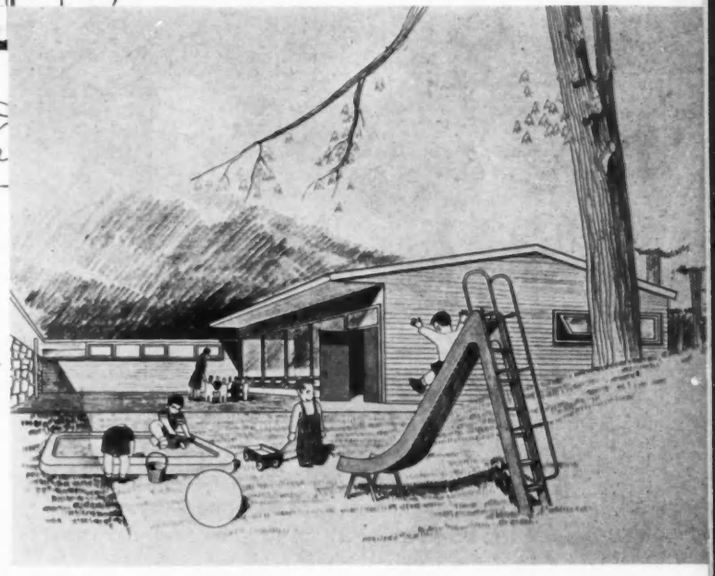
Access is by an existing approach road and by foot without conflict with automobile traffic. The approach road ends in a loop alongside an open but sheltered loading porch where children may also store bicycles. The lobby, at the end of this landscaped passage, opens to all four corridors, serves as gathering place during evening use by the community, when classroom wings can be shut off. Around this entrance court are all community and school facilities needing nearness: kindergarten, kitchen, cafeteria, auditorium.



Model of a classroom shows how naturally the square plan lends itself to three separate zones of use without structural subdivisions. Room shown in model is one-half of a classroom pair. Adjoining it is a duplicate with reversed plan. Together they make up one of the "little houses" strung on passage







Top of page: Cafeteria room has separate serving area, is therefore usable for many kinds of community function in the evenings. Directly above: Kindergarten play area.

Classrooms and classroom wings

Each pair of classrooms is made up into a little house, and these are staggered in position, to the left and right of corridors, as seen in the plan.

Although this disposition adds to exterior periphery, it is useful and economical. It allows multi-source daylighting (from three sides) with lower ceilings; increases privacy and diminishes noise with no need for expensive acoustical treatment; makes it possible to rely largely on cheap wood construction with adequate fire-safety in view of the numerous quick exits.

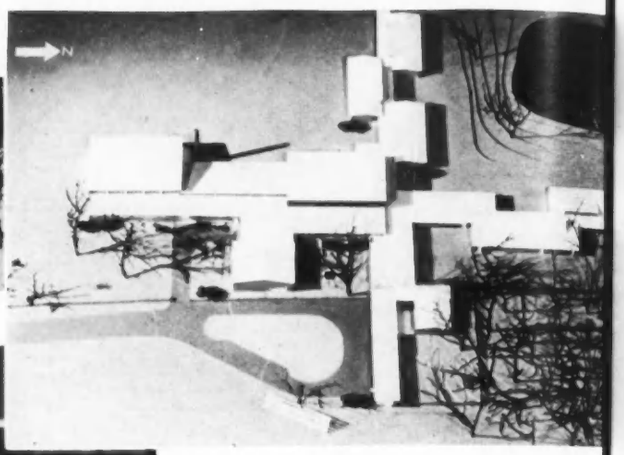
The individual classroom plan may be seen in the model, opposite page. The large windows in the foreground are hooded by overhangs, are low enough at the top for easily adjustable shading devices when struck by direct sunlight.

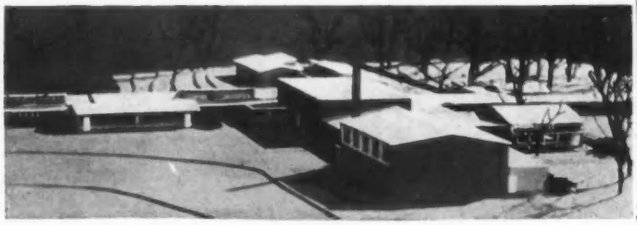
The roof is designed to sweep upward over the major room area, and produces clerestory windows above the corridor roof. A system of louvers is suggested in the drawing such as might be used to screen out sky-glare, admit efficient diffused light, maintain the low scale of the ceiling. There is, in addition, a large, full-story height window in the activity corner. Classrooms are about 26 by 35 ft. in area.

The architects are aware that the varying orientations plus the changing position of the sun will affect daylighting. They declare, however, that the sun cannot well shine from three directions at once, so glareless illumination can always be had from one or more of the three major sources.

No matter how the room stands to the sun, or where the sun stands in the sky, the architects believe that this multi-source system will provide at least one or more means of admitting light of good quality.

The model shows the interesting and attractive exteriors resulting from the logical plan grouping of functional parts for convenience and accessibility. Classrooms staggered on both sides of corridors permit multi-source lighting, quiet by isolation, and quick emergency exits





Specialized facilities

The auditorium is closely related to the entrance. It seats 300 people, has a stage 24 by 50 ft., small dressing rooms, storage, a projection room above the rear seats and a side stage with separate access.

Music room and general shop are also made part of the community facilities available to adults after hours.

The cafeteria is planned to seat 200; the serving counter is outside the room, can be entirely closed off. The kitchen is directly reachable from the approach road for deliveries and removals; is near the gymnasium.

The gymnasium is directly reachable independently of the rest of the building; can be subdivided (if wanted) for boys and girls by a folding partition; the boys' locker room, large enough to contain extra lockers for men, is specially placed to give maximum convenience for outdoor sports. On special occasions the gymnasium, filled with folding chairs, could provide for 600 people, or quite a few more than the auditorium.

The kindergarten has its own separate entrance from the bus shelter, and its own play area; but the children can get to the rest of the school by a corridor.

The administration and health unit is conveniently near the main entrance. Teachers are given a workroom and rest room, central but on the corridor leading to the primary classrooms.

Materials and Equipment

Steam generated in the heating plant is to be distributed through tunnels under the corridors to local heat exchangers and fan systems in the various heating zones. Zones can be operated separately by individual controls. Radiant heating will be combined with the forced warm air supply required by law.

Structurally the intention is to use brick masonry and wood construction, with steel framing to span some of the larger rooms. Corridors to be brick inside and out, and brick walls to serve as fire cutoffs between various parts of the building. Floors will be generally concrete laid on the ground, covered by resilient wearing-surface materials. Roofs may be wood planking on timber joists. Some exterior walls will be brick faced, some will carry wood sheathing or clapboards. Everywhere the treatment is to be direct, easy to maintain, reasonably safe, economical, pleasant.

RECENT DEVELOPMENTS IN RESIDENCE HEATING

By W. S. Harris

Special Research Associate Professor, University of Illinois

Part II: ***Advances in Boiler-type Heating***

In recent years many improvements have been made in domestic heating systems. These improvements have been made partly to take care of new and different demands on the heating system resulting from changes in the architectural treatment of homes, and partly to satisfy the demand for an even greater degree of comfort and convenience.

It is not the intent of this paper to try to discuss all the recent advances made in steam and hot-water heating systems, but rather to describe a little more in detail a few of the developments which have been brought about, at least in part, through research carried on under the terms of a cooperative contract between the University of Illinois and the Institute of Boiler and Radiator Manufacturers.

I=B=R RESEARCH

The Institute of Boiler and Radiator Manufacturers, a trade association whose membership list includes the names of a large majority of the manufacturers of cast iron boilers and radiators, is agreed that in order to render the best possible service to the user of steam and water heating equipment it must assist in every way it can, not only to improve the design of steam and hot-water heating equipment but also to find ways of improving the quality of installation as well.

In view of this, in 1940 a contract was signed by the Institute of Boiler and Radiator Manufacturers and the University of Illinois Engineering Experiment Station for a cooperative research program on steam and hot-water heating systems. This program has been active ever since the original agreement was signed. Under the terms of the original contract the I=B=R Research Home was built to provide a house in which precise tests on heating systems under actual use conditions could be made.

RESEARCH HOME

The Research Home, shown in Fig. 1, is a six-room, two-story building, typical of the small, well-built American home. The construction is brick veneer on wood frame, and all of the outside walls and the second-story ceiling are insulated with mineral wool bats 3⅝ in. thick. A vapor barrier placed between the studs and the plaster base prevents condensation on the sheathing by retarding the passage of water vapor from the rooms into the insulation in the walls. The calculated coefficient of heat transmission, U, for the wall section is 0.074 Btu. per sq. ft. per hr. per deg. F. temperature difference. All windows and the two outside doors are weather-stripped. Storm doors are used on the two outside doors. The total calculated heat loss under design conditions, with temperatures of −10° F. outdoors and 70° F. indoors, is 43,370 Btu. per hr. for the house, excluding the basement. The house is completely equipped with various types of instruments used in evaluating factors affecting comfort and cost of heating plant operation.

INSTALLATION

Experience has proved that really satisfactory heating results may be obtained from the following combination:

1. Use of well designed equipment.
2. Equipment properly sized and correctly installed.
3. Proper control during time of operation.

Slighting any one of these three items can be disastrous as far as satisfactory operation is concerned.

Realizing that all too frequently improper selection and installation of heating equipment is the cause of unsatisfactory heating results, also the cause of high installation costs, much of the work done in the Research Home since 1940 has been directed toward securing basic data which can be used by both the architect and the heating contractor in the selection and installation of steam and hot-water heating equipment. These data have been made available to the architect and the heating contractor through the publication of a series of I=B=R installation guides* covering the design of various types of heating systems.

These guides present simplified and accurate procedures which shorten de-

* Obtainable from The Institute of Boiler and Radiator Manufacturers, 60 East 42nd Street, New York 17, New York, price 25 cents each

Fig. 1. *I=B=R research home, University of Illinois*

signing time, and frequently reduce the cost of installation, as they enable one to design a system to meet a given need with a minimum of material and labor. For example, the weight of the pipe and fittings used in the installation of a one-pipe, forced-circulation, hot-water heating system in the Research Home made in accordance with the Installation Guide was approximately 18 per cent less than when installed in accordance with the best practices used by the trade in 1940. This saving in material was made with no sacrifice in performance or operating cost.

Boilers, radiators and pipe sizes have been reduced in size so that the total water content of the modern steam or hot-water heating system is much less than in older systems. This reduction in water content makes for a quicker response of the system to changes in the heating load. The curves in Fig. 2 illustrate the room temperature control obtained with a modern gravity hot-water system (supposedly a sluggish type of heating system) in the I=B=R Research Home on two different days during which the outdoor temperature changed rapidly. It will be noted that neither the sudden drop nor the rapid rise in outdoor temperature had an appreciable effect on the room air temperature at the thermostat level. In evaluating these curves it must be remembered that the I=B=R Research Home is insulated, but for these tests was not equipped with storm windows. Under such conditions 70 per cent of the total heat loss is attributed to the window and door area. Therefore, sudden outdoor temperature changes have an immediate effect on the load the heating system is carrying.

RADIATION

Location. Radiators should be placed under windows in order to give the best heating results. Tests in the Research Home have shown that with the radiators placed in this position the cool air currents descending from the windows are intercepted by warm air currents rising from the radiators. The mixing of these two currents results in a mass of air having a temperature not greatly above the normal room temperature, and thus both cool floors and overheated ceilings are prevented. It was found that when the small-tube radiators in the Research Home were located under the windows the floor-to-ceiling temperature difference was only about 4° F. when the outdoor temperature was zero. The floor to ceiling temperature difference increased to approximately 5.6° F. when the radiators were located along outside walls, but not under windows. Had the Research Home been an uninsulated house these temperature differences would have been considerably greater. Radiators or convectors of conventional design should not be placed along inside walls, as this location will produce objectionable currents of cool air across the floor of the room.

Although they may not have been aware of the real cause, most people have on some occasion experienced drafts created by cool air from the floors of upper stories spilling down an open stairway into first-story rooms. Such drafts often can be prevented by the proper placement of radiation. Generally, such stairways consist of two or more flights. A small radiator, or convector, placed on the stair landing, as shown in Fig. 3, is very effective in preventing the flow of cool air down a stairway. If there are more than two flights of stairs between the first and second story, the radiation should be placed on the uppermost landing. As the cool air reaches the stair landing it comes in contact with the heating unit and is warmed, causing it to rise toward the ceiling and return to the story above rather than to continue on down. Smoke studies have shown that an installation like that in Fig. 3 will reduce the flow of cool air down the stairway by about 75 per cent. The remaining flow is usually insufficient to cause noticeable draft.

On the basis of laboratory tests made on radiators of different styles the following conclusion was published in a University of Illinois Engineering Experiment Station Bulletin a number of years ago: "Long, low, thin cast-iron radiators placed under windows heat a room more comfortably and more economically than higher column or tubular radiators similarly placed."*

Radiant Baseboard. Recently full use of the preceding conclusion has been made in redesigning radiation for residential use in order that it would not only blend with the decorating scheme of the house, but would also have even better operating characteristics than does the conventional tubular radiation. This development is referred to as baseboard radiation and consists of a long, low radiator, or convector, usually about six inches high and two inches wide, made to resemble a conventional baseboard and installed along the outside walls of the rooms in place of the usual wooden baseboard, Fig. 4.

For a period of several years tests were conducted in the Research Home to determine the operating characteristics of units of this type. The results of these tests showed that at an outdoor temperature of 0° F. and an indoor temperature of 72° F. at the 30-in. level, when the rooms were heated by the radiant baseboards, the average floor to ceiling temperature difference was only about 2° F., as compared with 5½° F. obtained when the rooms were heated by conventional recessed radiators. The average air temperature obtained 3 in. above the floor was about 1.4° F. warmer

* "Investigation of Various Factors Affecting the Heating of Rooms with Direct Steam Radiators." Univ. of Ill. Eng. Exp. Sta. Bul. 223, 1931, p. 90.

Fig. 2-A

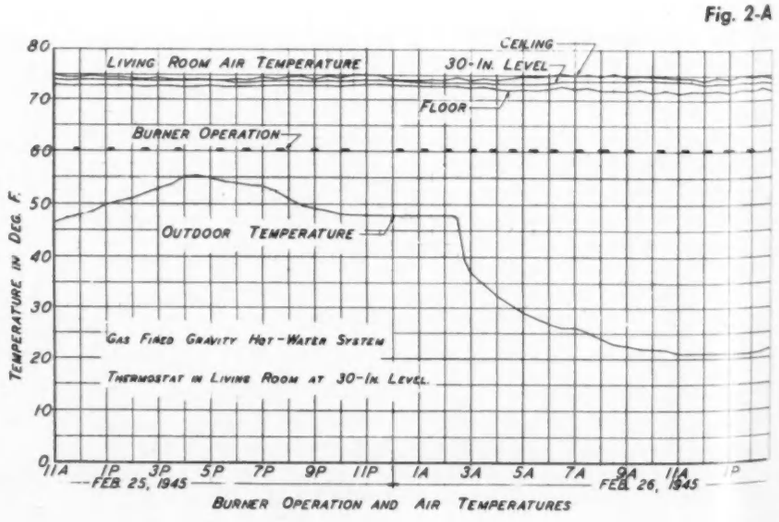


Fig. 2: *temperature performance charts, for two days on which outside temperatures varied widely, with gravity system*
Fig. 3 *(opposite page) convector on stair landing to eliminate drafts down stairway*

than that obtained with conventional recessed radiators, and the use of a radiant baseboard in the lavatory, which had a concrete floor laid directly on the ground, raised this temperature 6° F. A cold floor is a major factor in contributing to discomfort in otherwise well-heated rooms, hence the tendency to produce a warm floor may be regarded as an important attribute of radiant baseboard. This attribute is most important in the case of the basementless house in which cold floors are particularly prevalent. Therefore, the use of radiant baseboard is especially adaptable to this type of construction.

The temperature of the entire wall below the 60-in. level was higher than that of the room air at the 30-in. level when radiant baseboard was used, whereas with the conventional recessed radiators the temperature of this portion of the wall surface was from 0.2 to 1.6° F. lower than the temperature of the air at the 30-in. level.

When operating with reduced air temperatures at night, the performance obtained with radiant baseboard was, in general, the same as that obtained with the conventional recessed radiators. However, in the case of the radiant baseboard, the overruns in the temperature of the air 3 in. below the ceiling during the warming-up period were somewhat less. No material difference in fuel consumption could be attributed to the radiant baseboard.

It was further observed during these tests that at the end of the heating season, curtains hanging at windows under which radiant baseboards were located were just as clean as curtains hanging at windows under which no radiation was present; neither were in serious need of cleaning while curtains hanging at windows over conventional radiators were in need of cleaning well before the end of the heating season.

The present architectural trend toward the use of large glass areas presents distinct heating problems. It is essential that these large glass areas be protected by a heat source to prevent the cold air currents produced by the glass from flowing across the floor. Fig. 5 is a photograph of an installation of radiant baseboard in a basementless house in which the glass areas extend to within a few inches of the floor. After one season of operation the occupants of this home report that at no time were cold floors experienced.

Panel Heating. So much has been written recently about panel heating that it hardly seems necessary to mention it again here. In most cases panel systems have exhibited excellent operating characteristics. They are especially adaptable to basementless house construction. Occasionally the construction of the heating panel is such that the heat storage of the panel makes the system slow to respond to quick changes in heating load. To guard against this one should keep the mass of the heating panel as low as is practical. While modern panel heating installations have been quite successful, the author is of the opinion that there is still need of much research along these lines to supply basic data required to properly design and operate systems of this type and to eliminate some of the confusion of ideas which now exists. No doubt, when these data are obtained, the installation costs of panel systems may be reduced so that they will be more in line with the installation costs of the more conventional heating systems and at the same time the performance characteristics may be further improved.

DOMESTIC HOT WATER

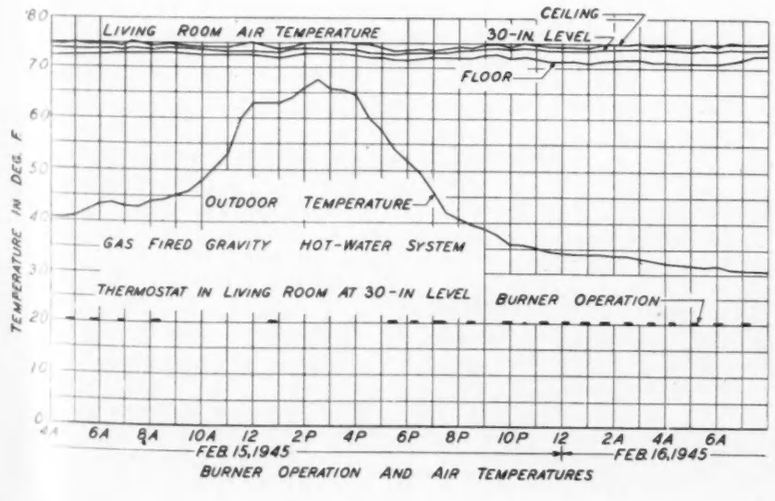
In homes heated with steam or hot-water heating systems, the practice of using the house heating boiler in conjunction with an indirect water heater to supply hot water for domestic uses the year around is becoming prevalent. The advantages claimed for this practice are: an abundant supply of hot water is available at all times, fewer units of mechanical equipment are required, operation is economical, and a minimum amount of floor space is required for the equipment involved.

These systems usually consist of a water heating coil installed inside the boiler sections and immersed in the boiler water, or an external heat exchanger through which both the boiler water and the domestic hot water circulate. There are two types of indirect water heaters: the slow recovery, or storage type, and the instantaneous, or tankless type. The tankless heater contains much more heating surface than does the storage type heater, so that it is able to heat the domestic service water as rapidly as it is drawn off at the faucet. The storage type heats water at a slower rate, and is always used in conjunction with a storage tank in which the hot water is stored for use as needed. Diagrams of typical heater arrangements and piping connections are shown in Fig. 6.

Many installations of indirect water heaters in house heating boilers have already been made, and only recently results of detailed studies of the operation of such systems have been published.* The tests at the University of Illinois were made on an indirect, storage type water heater located in an oil fired house heating boiler and connected to a horizontal, insulated, 30-gal. hot-water storage tank. With this arrangement it was found that during the

* "Performance of an Indirect Storage Type of Hot-Water Heaters," Univ. of Ill. Eng. Exp. Sta. Bul. 366, 1947, and "Field Study of Domestic Hot Water Service from Gas Fired Boilers," American Gas Association Testing Laboratories Research Report No. 1060-B, 1947.

Fig. 2-B



BURNER OPERATION AND AIR TEMPERATURES

Fig. 3

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

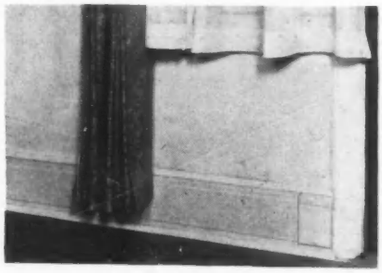


Fig. 4: *typical installation of radiant baseboard*

Fig. 5: *radiant-convector combination baseboard installed under large glass areas to counteract down draft*

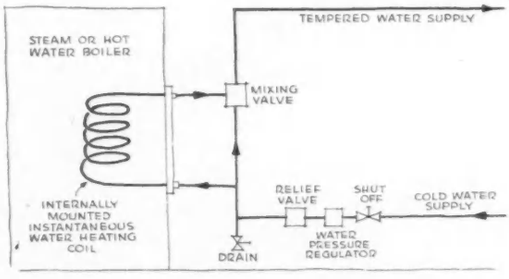
heating season, when the boiler was being used to supply both heat and domestic hot water, the average daily consumption of fuel oil chargeable to supplying 50 gal. of 150° F. water daily was only 0.36 gal., representing a monthly oil consumption of slightly less than 11 gal. During the summer, when the boiler was used to supply hot water only, approximately 1.4 gal. of oil per day were required to supply 50 gal. of 150° F. water daily, representing a monthly fuel consumption of 42 gal. for summer operation. The higher fuel consumption during the summer can be attributed to the actual loss of heat from the boiler, the piping, storage tank, and chimney, which losses are regained as useful heat in the house during winter operation.

The results of these tests indicate that, assuming a heating season of eight months' duration, the annual cost of heating domestic hot water at the rate of 50 gal. daily with oil at 12 cents per gal. is $31.15 per year, or about $2.63 per month. Increasing the quantity of hot water used from 50 gal. daily to 100 gal. daily resulted in an increase in operating cost of approximately 20 per cent. These operating costs compare favorably with the cost of operation of most separately fired water heaters.

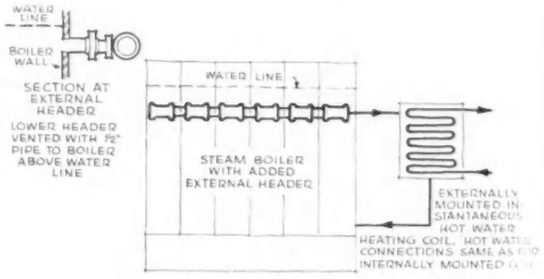
Summer operation of the boiler to provide domestic hot water eliminates condensation on boiler surfaces during the summer and during the tests made in the Research Home it eliminated condensation on basement walls and floor usually experienced because of the humid atmospheric conditions prevalent at this time of the year.

Fig. 6

Courtesy American Gas Association Testing Laboratories

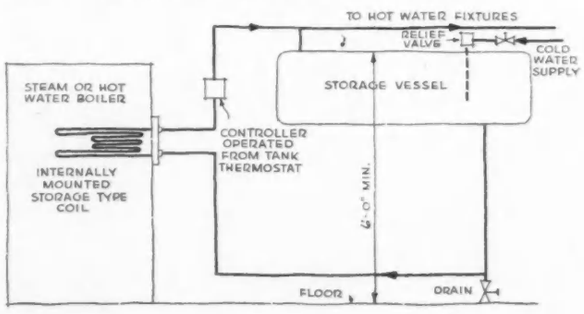


Above: Instantaneous hot water heater with internal coil

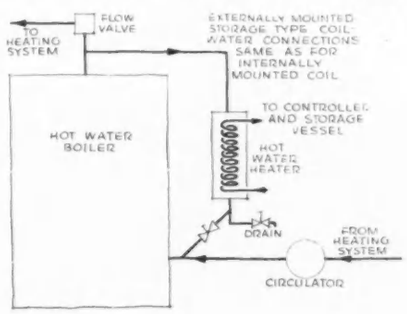

WATER LINE
BOILER WALL
SECTION AT EXTERNAL HEADER
LOWER HEADER VENTED WITH ¾" PIPE TO BOILER ABOVE WATER LINE
WATER LINE
STEAM BOILER WITH ADDED EXTERNAL HEADER
EXTERNALLY MOUNTED INSTANTANEOUS HOT WATER
HEATING COIL, HOT WATER CONNECTIONS SAME AS FOR INTERNALLY MOUNTED

Above: Instantaneous hot water heater with external coil

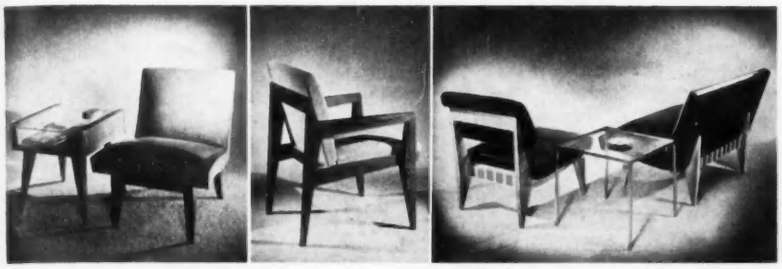
Below: Storage-type hot water heater with internal coil



Below: Storage-type hot water heater with external coil



PRODUCTS for Better Building



Some of the pieces in the Armbruster collection of furnishings designed for public use

FURNITURE

A new and comprehensive collection of seating and tables designed by an architect for architects is offered for public and institutional use, such as in hotels, showrooms, offices, stores, ships, trains and terminals. Designed by William Armbruster, the new line is for sale only to architects, and will not be carried by retail suppliers.

Detailed and constructed to take heavy punishment, the furniture is made of kiln-dried oak in three finishes — light, medium and dark. Upholstered pieces feature white ash frames and spring and foam-rubber construction. According to the manufacturer, all pieces in the line are of clean design and will lend themselves to any desired treatment and application. The Armbruster Collection, Edgewood Furniture Co., 60 E. 13 St., New York 3, N. Y.

FIRE RESISTANT PANELING

A fire-resistant steel and plastic paneling has been announced which in official tests is said to have withstood applied heat in excess of 2200° F. for more than 30 minutes. Made of Du Pont "Strux" cellular cellulose acetate plastic sandwiched between 0.006-inch carbon steel, the panels were developed primarily to reduce aviation fire hazards, but obviously will have many other uses. The test panels are ¼ in. thick and weigh less than 1 lb. per sq. ft.

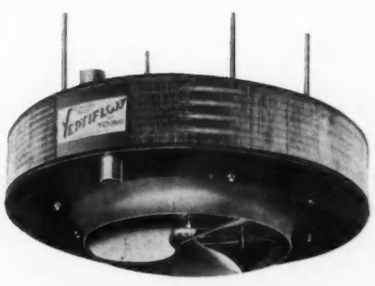
MOLDING

Savings of both time and money in the installation of plywood panels are reportedly made possible by the use of a new molding developed for U. S. Plywood by Keller Products, Inc., of Manchester, N. H. The moldings are designed to completely eliminate the necessity for fitting, nailing, counter-sinking and puttying. Made to fit a ¼ in. panel, and adjustable to accommodate slightly varying thicknesses based on the ¼ in. panel, the moldings are available in four types: inside corners, outside corners, cap and divider strips. They are made with genuine wood veneer faces, bonded to extruded aluminum, in oak, mahogany, walnut, birch, maple, Korina and primavera. For wall installation they may be nailed to the studding. United States Plywood Corp., 55 W. 44th St., New York 18, N. Y.

UNIT HEATERS

An interesting circular, vertical discharge type unit heater called the *Vertiflow* features a motor-cooling method known as "open-stack" ventilation (patent applied for). The motor is mounted in a stack, open at both ends, at the center of the circular heating core to eliminate "motor baking."

Specially designed fans draw room air through the stack, while at the same time directing the air taken from the heated core downward through the fan opening. This provides a flow of air around the motor which reduces the motor operating temperature, according to the manufacturer, as much as 75 per cent. When the motor is off, the core-heated air rises and forms a natural draft as it passes over the top of the stack. Cooler air is thus drawn up through the stack, cooling the motor continuously.

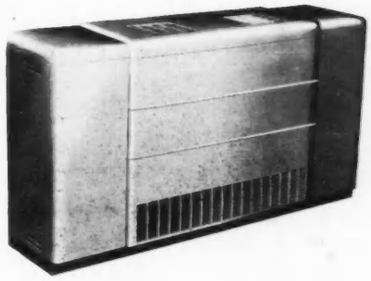


This vertical discharge type unit heater features an unusual motor-cooling method

Increased heating efficiency, reduction of operating noise and a saving of 35 per cent in total weight are advantages claimed for the unit. Seven models are available, to deliver from 52,600 to 552,000 Btu's per hour under standard operating conditions. Young Radiator Co., Racine, Wisc.

HUMIDIFYING UNIT

A compact unit for humidification in industrial applications, is entirely self-contained, with all essential parts built in. Consisting of four humidifying nozzles, water tank with float valve, water strainer, air filter, air regulator with pressure gauge and solenoid operated valve, the unit has a humidistat for automatic control. The four nozzles, designed to atomize 35 lb. of water per hour using 5 C. F. M. of atomizing air supplied at 32 psi., are individually adjustable for position, so that the direction of the sprays may be set as required. Spraying Systems Co., 4021 W. Lake St., Chicago 24, Ill.



A unit ventilator designed for schoolroom use has scuff board and rounded corners

UNIT VENTILATOR

Especially designed for schoolrooms, auditoriums and industrial installations, the *Trane Unit Ventilator* features a new type of resilient belt drive which is said to give more even heat distribution and greater efficiency at lower maintenance cost. Standard motors can be used and complicated connections and couplings are eliminated. A non-freeze or steam distributing coil is used to prevent freeze-ups in even the coldest weather when heating below-zero outside air for ventilation.

The unit also features a redesigned cabinet with rounded corners to provide greater safety for small children and a recessed scuff board across the entire front. The Trane Co., La Crosse, Wisc.

CALCULATOR

A handy new device, the *Elemoto Dimension Adder and Subtractor*, adds and subtracts fractions of inches and feet by mechanical means. It operates somewhat in the manner of a dial telephone,

(*Continued on page 176*)

MANUFACTURERS' LITERATURE

ABRASIVE FLOORS

Norton Abrasive Floors. Catalog covering the four types of Norton abrasive floor: alundum terrazzo aggregate, alundum cement floor aggregate, alundum ceramic mosaictile, alundum stair and floor tile. Gives application, specifications, colors and sizes of all types. 12 pp., illus. Norton Co., Worcester 6, Mass.*

AGGREGATE

Aggregate (Bulletin No. 701). An educational treatise on aggregate, giving recommendations of leading cement companies and the Portland Cement Association for good aggregate; comparative strength analysis on emery aggregate and other aggregate. 12 pp., illus. Walter Maguire Co., 330 W. 42nd St., New York 18, N. Y.

BUILDING

Unit Structures. Catalog describing a complete line of glued-laminated arches, trusses, beams, rafters for roof supports. Complete specifications and design data. 12 pp., illus. Unit Structures, Inc., Peshtigo, Wisc.*

CONVENIENCE OUTLETS

No. 800 Floor Box (Catalog No. 554). A review of convenience outlets for light, power, signal and bell systems. Shows installation details with high and low potential service fittings for use in conjunction with underfloor electric distribution systems. 4 pp., illus. National Electric Products Co., Chamber of Commerce Bldg., Pittsburgh, Pa.

ELECTRIC RANGES

Cooking Electrically. Booklet describing advantages and values of the modern electric range. Time and temperature charts. 12 pp., illus. National Electrical Manufacturers Assoc., 155 E. 44 St., New York, N. Y.

ELEVATORS

Pow-R-Truck Elevators. Bulletin on design features in Otis Pow-R-Truck freight elevators to absorb punishment from power-driven materials handling equipment. Diagrams, sizes and capacities are given as well as hoistway requirements in industrial buildings. 8 pp., illus. Otis Elevator Co., 260 11th Ave., New York 1, N. Y.*

Nordyke Service Elevator (Bulletin No. 06B6878). Describes inter-floor Nordyke service elevator for a variety of industrial installations such as feed and flour mills, food mills, paper plants, warehouses, filtration and power plants, etc. Diagrams show safety measures for various installations. 8 pp., illus. Allis-Chalmers Mfg. Co., Milwaukee, Wisc.

EMERGENCY ELECTRIC PLANTS

Onan Standby Everywhere (Folder, Form A-194). Description of Onan Automatic a-c Line Transfer Controls designed to switch over the electrical load to the stand-by unit after main power line fails. Includes table of capacities. 8 pp., illus. D. W. Onan & Sons, Inc., 43 Royalston Ave. N., Minneapolis 5, Minn.

FANS

Axiflo Fans (Booklet B-3804). Describes economic and versatile performance of Westinghouse Axiflo Fans for air conditioning, heating and ventilating, dust and fume removal, equipment and machinery cooling, heat treating non-ferrous metals and industrial drying and processing. 8 pp., illus. Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa.*

FIRE ALARMS

Fire Alarm Equipment Reference Booklet. Gives wiring diagrams, illustrations and descriptions of fire alarm systems, and complete data on boxes, signals, punch and printing recorders. Included are suggested electrical specifications for code-ringing, pre-signal, master code and continuous ringing fire alarm systems. Autocall Co., Shelby, Ohio.

FLUSH VALVES

Delany Flush Valves. Bulletin describing Delany flush valves, with diagrams and illustrations of assembly. 4 pp., illus. Coyne & Delany Co., Kent & Park Aves., Brooklyn, N. Y.*

GENERATORS

Synchronizer (Vol. 8, No. 3-A). Covers the new "packaged" Regulectric a-c generator and includes seven tables for generator and wire selection, diagrams, dimensional drawings, etc., to aid in the selection of generators. 16 pp., illus. Electric Machinery Mfg. Co., Minneapolis 14, Minn.

GLASS

Glass for the Architect. Booklet describing Libbey-Owens-Ford glass products, qualities and uses. Includes discussion of Thermopane glass insulating units, polished plate and window glass, Tuf-flex tempered polished plate glass, Vitrolite colored structural glass and Blue Ridge patterned glass. Illus. Libbey-Owens-Ford Glass Co., Nicholas Building, Toledo 3, Ohio.*

LIGHTING

Recessed Troffers (Bulletin 20-A). Catalog of applications, installations and data on Day-Brite troffers. Tables, dimensional drawings, installation details for interior lighting, specifications and pricing data. Includes tables for figuring footcandle intensities. 44 pp., illus. Day-Brite Lighting, Inc., 5411 Bulwer Ave., St. Louis 7, Mo.*

NYLON

Nylon Textile Fibres in Industry. Booklet enumerating industrial applications of nylon, including automotive, marine, aircraft, etc. Sections are also devoted to nylon's properties and strength, toughness, elasticity, resistance to light, heat, chemicals, etc. 30 pp., illus. E. I. DuPont de Nemours & Co., Wilmington 98, Del.*

OIL BURNERS

Rexoil, Tops in Automatic Oil Heating. Brochure highlighting the "Quick Cut-Off Fuel Hoarder," the "Montrol Air Adjustment," and "Air-stream Turbulation," all exclusive Rexoil features. Pictured are individual units as well as complete burners. 4 pp., illus. Reif-Rexoil, Inc., Buffalo 3, N. Y.

PLASTICS

Handbook of the Society of Plastics Industry. Standard information on plastics and the best practice of the plastics industry. Covers classification of plastics molding materials, molding and forming, design of molded articles, design standards for inserts, standards for tolerances on molded parts, cementing and assembly of plastics, testing plastics parts, mold design and recommended steels, machining and finishing, laminated products and their fabrication. Five hundred charts and illustrations, 451 pp., indexed. Society of the Plastics Industry, 295 Madison Ave., New York 17, N. Y. *$7.50* (free to members of the Society).

POWER BOILERS

Kewanee Power Boilers, Operation and Care. Gives details of construction, operation and care of Kewanee high pressure boilers. 16 pp., illus. Kewanee Boiler Corp., Kewanee, Ill.*

SAFETY TREADS

Wooster Safety Treads (Catalog 48). Describes the principal types of safety treads, elevator sills, abrasive cast, rolled and extruded metal thresholds, window sills, curb bars and trench covers. Typical installation methods,

(*Continued on page 190*)

* *Other product information in Sweet's File, 1948.*

three things to remember about Sound Conditioning...

first: THAT NO NEW BUILDING IS MODERN WITHOUT IT...

Today it is known that noise and poor hearing conditions make people uncomfortable and lower their efficiency. This has made sound conditioning as important as good lighting in the specifications for modern buildings—commercial, school, hospital, or church. *That is why the number of new building installations of Acousti-Celotex sound conditioning has more than doubled in the last two years.*

second: THAT IT MAKES OFFICE SPACE EASIER TO RENT...

A building with Acousti-Celotex sound conditioning is easier to rent because it provides a better working environment – reducing employee fatigue, increasing accuracy and insuring a greater volume of work. *This is one of the reasons why more buildings of all kinds have been sound conditioned with Acousti-Celotex* products than with any other material.*

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YOU ARE INVITED to submit your acoustical problems to a trained sound technician—your nearest distributor of Acousti-Celotex products.

He brings you a knowledge based on the proved performance of Acousti-Celotex in more than 200,000 installations. Look for him in your classified phone directory . . . or drop us a line saying when you would like to see him. In the meantime, you'll find Acousti-Celotex products listed in Sweet's File, Section 11-A3. Sound conditioning is a sound investment.

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THE CELOTEX CORPORATION, CHICAGO 3, ILLINOIS

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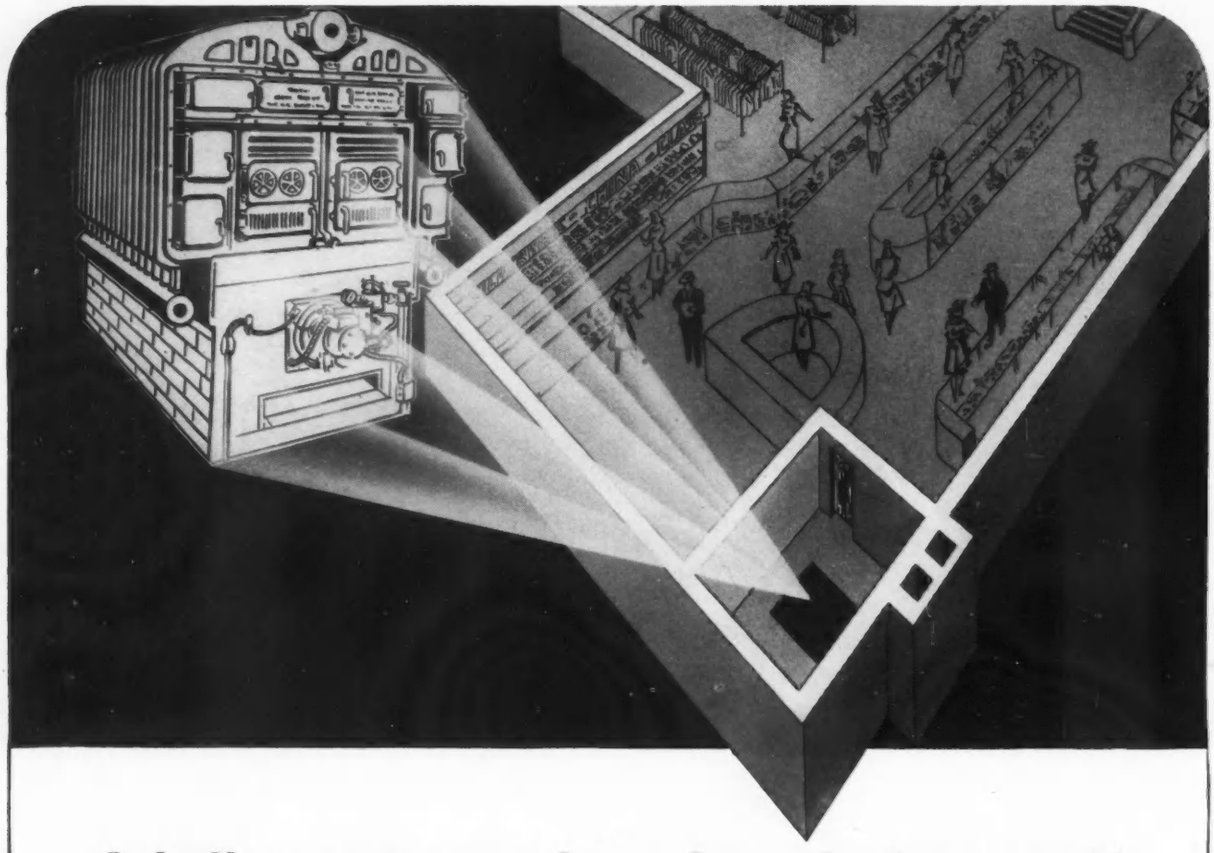
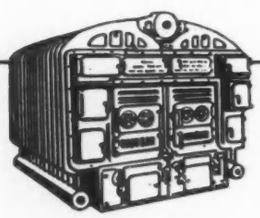


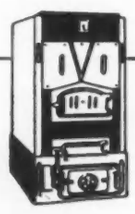
A boiler room can be a bargain basement!

Chain stores can't take in money over counters that don't exist. Architects know that the smaller the boiler room, the greater the basement area that can be devoted to storing, displaying and *selling* merchandise. Heating contractors often show the way to smaller boiler rooms by specifying Smith-Mills boilers . . . because Smith-Mills boilers are constructed of cast iron, therefore do not need large open working spaces in front of the boiler for replacement of tubes.

Because Smith-Mills boilers have plenty of heating surface to efficiently absorb heat generated by intense, blast-like oil, gas or stoker flames — even at peak firing rates — they are outstandingly efficient for automatic firing. This fact means, too, that they deliver maximum heat per square foot of basement space.

Yes, a boiler room can be a bargain basement . . . or a classroom, ward or tool room. In store or school, hospital or factory, Smith-Mills boilers are saving valuable space — and money, too. Write for the *facts*.





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ARCHITECTURAL ENGINEERING
TECHNICAL NEWS AND RESEARCH

SCHOOLS: PUPILS' WORKING HEIGHTS · DATA ON SPECIAL TOILETS

From Manual of School Planning 1947, Board of Education, City of New York; N. L. Engelhardt, Assoc. Superintendent

PUPILS' WORKING HEIGHTS

	ITEMS	PRE. KDG.	KDG.	1–3	4–6	7–9	10–12	SHOPS	CRMD	NATURE STUDY
FURNITURE	Chairs	9″–10″	10″–12″ & 14″	12″–14″ & 16″	13½″–14¾″	16″ & 17¼″	18″		15″ & 18″	Tablet Armchair 18″
	Desks			22″ & 24½″	24¾″–26½″ & 28¼″	28¼″ & 30″	30″			
	Seats			12″ & 14″	13½″–14¾″ & 16″	16″ & 17¼″	17¼″			
	Stools							18″ to 22″		
	Tables †	18″	18″–20″	22″ & 24½″	24¾″–26½″ & 28¼″	28¼″ & 30″	30″		26½″ & 30″	
	Typing Desks					26″	26″			
	Work Benches	24″	24″	26″ & 28″	28″–30″	30″–34″	32″–34″ & 36″	30″–32″ 34″–36″		
FIXTURES	Drinking Fountains	24″	24″	30″	30″	30″	34″			
	Lavatories	22″	24″	25″	25″	27″	31″	31″	31″	
	Sinks	22″	24″	27″	30″	33″	36″	33″	30″	33″
	Waterclosets	10″	10″	15″	15″	15″	15″		15″	
BUILT IN EQUIPMENT	Chalk Rails *	20″	22″	24″	28″	33″	36″	36″	30″	30″
	Counters	22″	24″	27″	30″	33″	36″	36″	30″	30″
	Hook Rails	30″	37″ & 41″	50″–57″ & 67″	50″–57″ & 67″	57″	57″	50″–57″ & 67″	50″–57″ & 67″	50″–57″ & 67″
	Mirrors	28″	30″	36″						
	Railing	Railings in General Office, Shops, etc., 36″. Handrail in cripple C. R. 30″ high.								
	Handrails on Stairs	Elementary and Junior High Schools 20″ & 30″ high. (Railing proper 4′–0″) High Schools—30″.								

NOTES

* In the main, tops of blackboards and/or display boards over, shall line up with transom bar and top of other cabinet work in the room. Vertical dimension of blackboards may vary, depending upon chalk rail height. The tops of independent bulletin boards and display cases shall line up with transom bar and the bottom shall line up with chalk rail when possible. The vertical dimension of blackboards in kindergartens and lower grade classrooms is usually 3′–6″ and other items in the room should line up with the top, doors excepted.

† Drawing tables are required in a range of three heights 36″, 38″, and 40″ at the lower edge with a fixed slope of 7 degrees. These are equally distributed in each room and stools 26″, 28″ and 30″ are provided.

SPECIAL TOILETS IN SCHOOLS (General Toilet Requirements, see local codes)

PURPOSE SERVED	FEMALE No. of Rooms	FEMALE Fixtures Per room W. C.	FEMALE Fixtures Per room Lav.	MALE No. of Rooms	MALE Fixtures Per room W. C.	MALE Fixtures Per room Ur.	MALE Fixtures Per room Lav.	B.	Location (floor) 1	2	3
Kindergarten	one	2	2	one	2	–	2		X		
Dressing Room	one	1	2	one	1	–	2		X	x	
Custodial Employees	one	1	1	one	1		1	X	x		
Medical & Dental Suite	one	1	1						X		
Principal's	one	1	1						X		
Playground (Exterior)	one	1	1	one	1	2	2	x	X		
Teachers (Elementary & Jr. High)	two	2	1	one	2		1		x	X[2]	X[1]
Teachers (H. S.)	three	2	1	three	1	2	1		X	X	X[3]
Public (Auditorium)	one	3	2	one	1	2	2	x	X	x	
Gym. Instructor	one	1	1	one	1		1		X	x	
Cafeteria Help	one	2	2	one	1		1	X	x	x	
Gym. (Elem.)	one	2	1	one	1	2	1		x	x	
Gym. (Jr., Sr. H. S.)	one	4	1	one	1	3	1		x	x	

[1] *Alternate Floor* [2] *Each Floor* [3] *Alternate Floor*

WASHING FACILITIES

No. of Pupils	Stations
100	2
200	4
300	6
400	7
500	8
600	9
700	10
800	11
900	12
1000	13
2000	23

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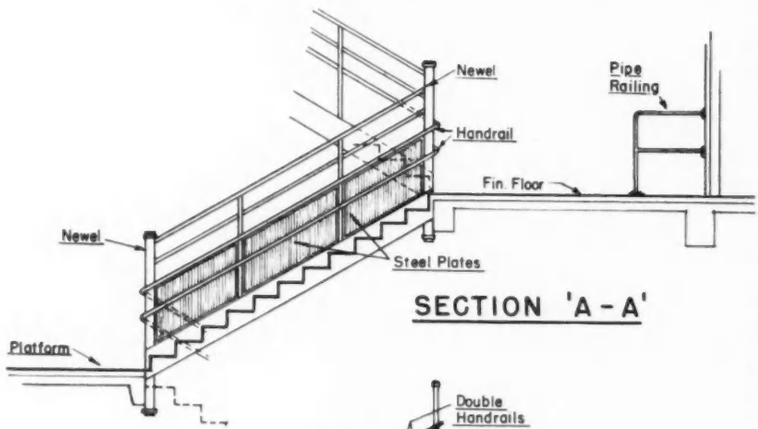
SAFE STAIRS FOR SCHOOLS

From Manual of School Planning, Board of Education, City of New York, 1947; N. L. Engelhardt, Assoc. Sup't

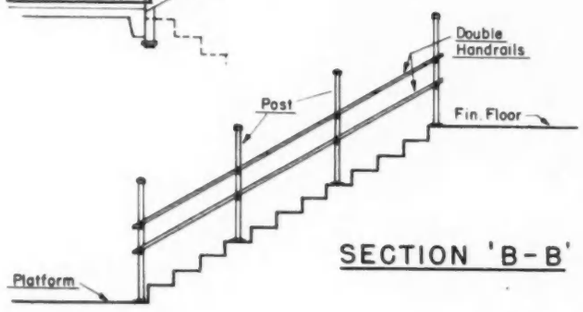
In addition to the primary function of providing access and egress to and from various floor levels, the stairs of a multi-story school building play an important part in the departmentalized educational program. Practically the entire school population moves from one location to another at forty-five minute intervals. Much of this movement is, of necessity, from floor to floor. Large numbers of pupils, going in opposite directions, must pass each other on the stairs without conflict. Lines coming into a stairway from one floor must flow smoothly into the lines which may be coming up or down from other floors. Time is of the essence in this procedure. In order to facilitate the flow of traffic the space relationship of school units should be considered in conjunction with the location of stairways.

The safety of pupils is paramount at all times, especially on stairs. Any potential hazards must be eliminated. Stairs should be "easy going," that is, there must be an appropriate relationship of riser to tread. Treads are of non-slip material which is also extended onto platforms and landings for a distance equal to the width of the stair treads. Double handrails, one higher than the other, are provided on stairs for each line of short or tall pupils. The posts, which support the center handrails of double stairs, are extended high enough above the top handrail to prevent pupils from sliding down.

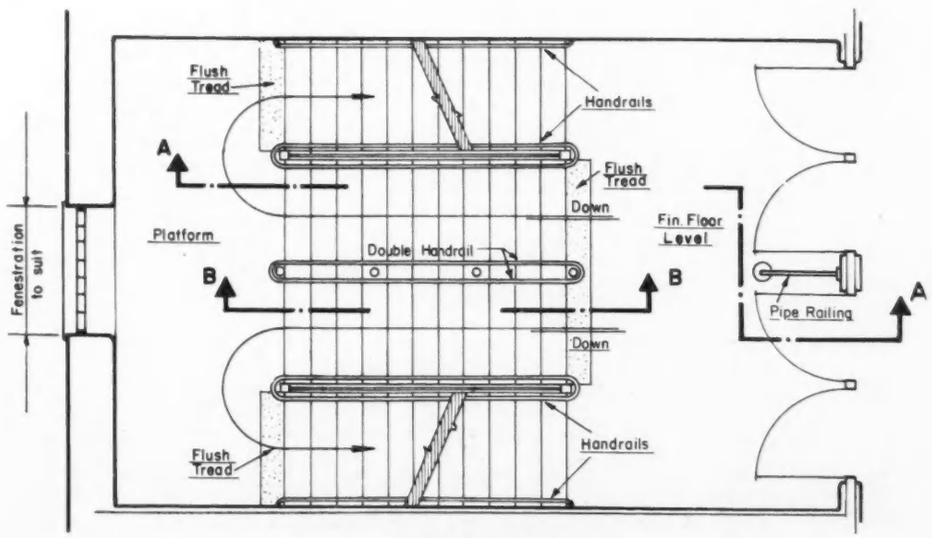
Editor's Note: School systems such as New York City pay especial attention to stairs because they use the so-called "platoon" system of teaching, in which large numbers of pupils are moved frequently.



SECTION 'A-A'



SECTION 'B-B'



· PLAN · VIEW ·

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MICHAELS PRODUCTS

Bank Screens and Partitions
Welded Bronze Doors
Elevator Doors
Store Fronts
Lettering
Check Desks (standing and wall)
Lamp Standards
Marquises
Tablets and Signs
Name Plates
Astragals (adjustable)
Stair Railings (cast and wrought)
Wrought and Cast Radiator Grilles
Grilles and Wickets
Kick and Push Plates
Push Bars
Cast Thresholds
Extruded Thresholds
MI-CO Parking Meters
Museum Trophy Cases

The MICHAELS ART BRONZE Company, 234 Scott St., Covington, Ky.

Member of the National Association of Ornamental Nonferrous Metals Manufacturers

★

THE RECORD REPORTS

(*Continued from page 20*)

Engineers, Cleveland, Ohio.

March 22–24: 1948 Chicago Production Show and Technical Conference. Chicago Technical Societies Council, Stevens Hotel, Chicago, Ill.

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RECORD DOLLAR VOLUME OF BUILDING IN 1947

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Last year's increase in contract volume did not reflect fully the performance of the construction industry, Thomas S. Holden, president of the company, points out. Last year opened with an extraordinary volume of construction projects contracted for and started in 1946, which were carried over into 1947 for completion.

The year was marked, comments Mr. Holden, "by a very considerable speed-up in rates of completion of all types of residential and nonresidential projects following the industry's faltering performance in 1946 when strikes in major industries slowed building material deliveries, and various governmental controls and restrictions interfered with the smooth functioning of the industry."

The 1947 total for building and engineering contracts in all classifications was $7,759,868,000, compared to $7,489,722,000 in 1946. Within the overall increase of $270,000,000, heavy engineer-

(*Continued on page 158*)

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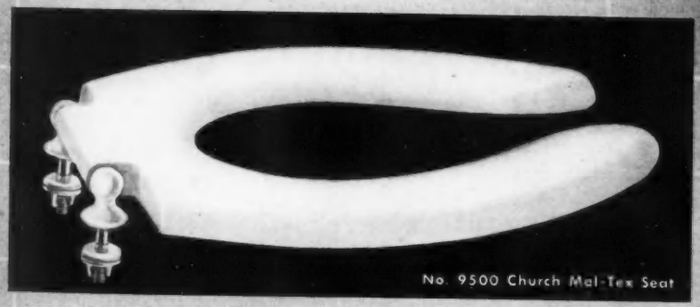

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Lighting

THE RECORD REPORTS

(*Continued from page 156*)

ing projects accounted for $259 million and combined residential and nonresidential building accounted for $11 million. By a narrow margin, residential contracts at $3,153,773,000 exceeded the dollar volume of any previous year. Reflecting the higher construction costs that prevailed in 1947, there was a 11 per cent decline from the preceding year in floor area contracted for.

Residential building was marked by a substantial increase in rental housing. Investment commitments for apartment projects amounted to $855,974,000, compared to $486,495,000 in 1946, an increase of 76 per cent. In 1947 contracts for public building and engineering projects represented 30 per cent of the dollar total, compared with 23 per cent for 1946. This increase reflected principally the marked upswing in public engineering projects.

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The latest move in Canada's campaign to save U. S. dollars has been the regulation of imports of structural steel and machinery.

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Get Busy WITH A BRASCO FRONT

Architects: Sidney H. Morris & Associates, Chicago

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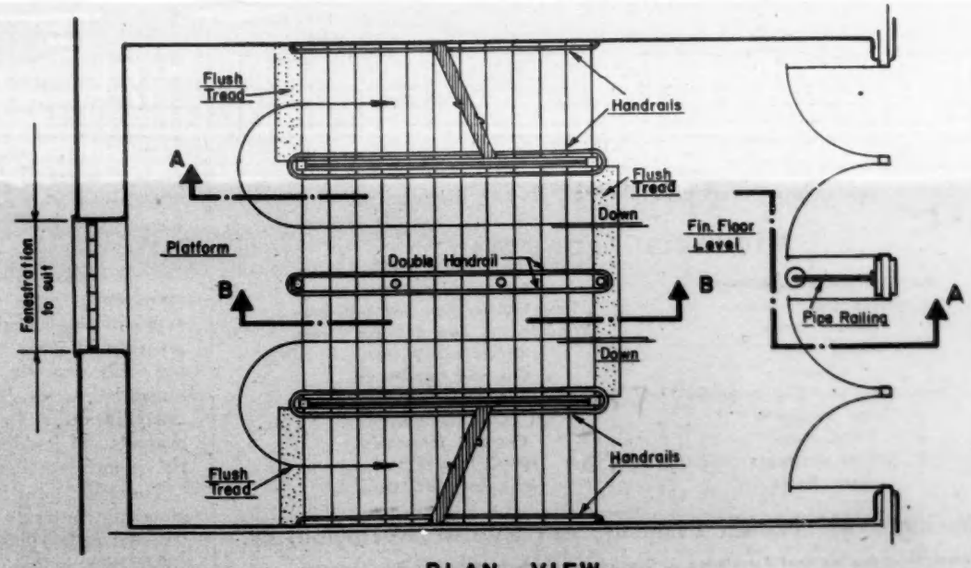

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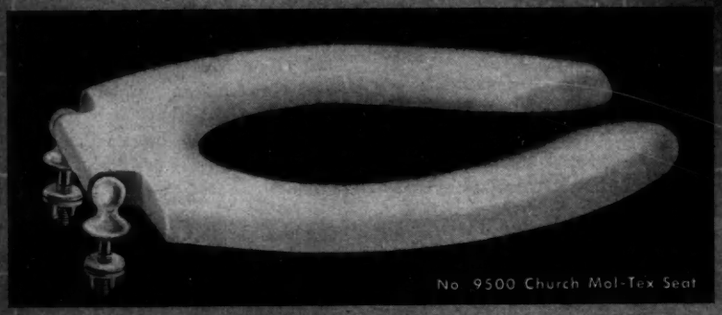

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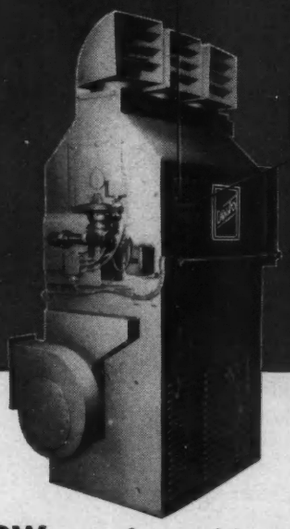

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THE RECORD REPORTS

(*Continued from page 156*)

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The latest move in Canada's campaign to save U. S. dollars has been the regulation of imports of structural steel and machinery.

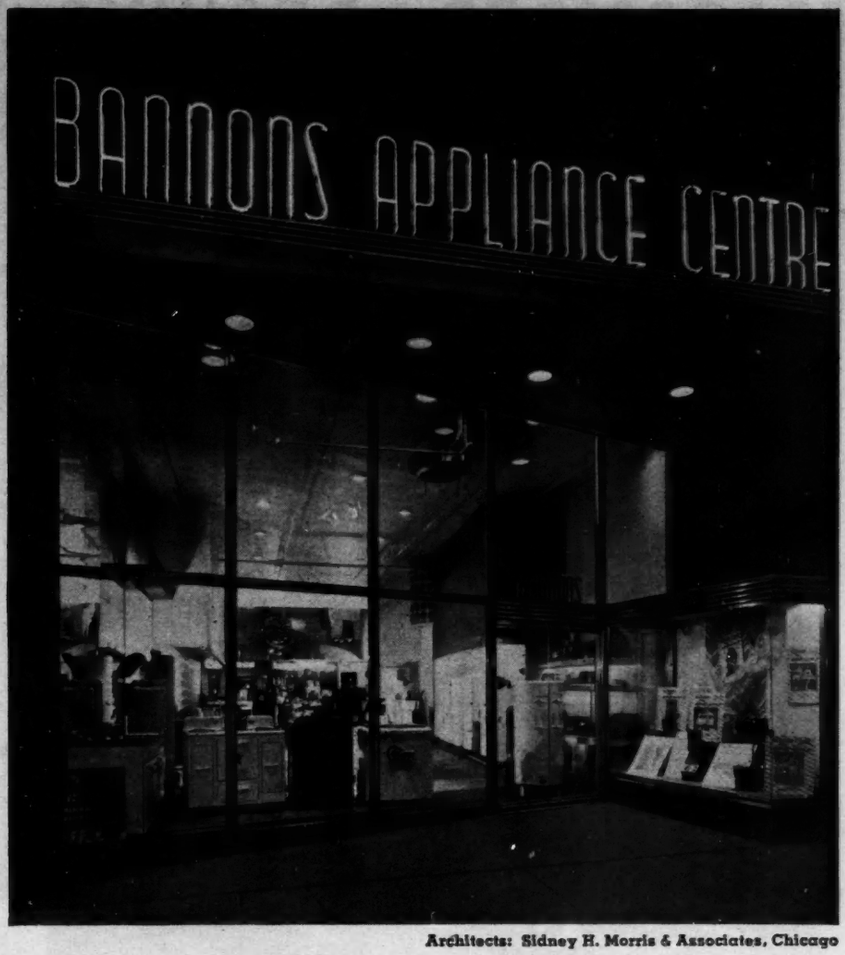
The new measure, which went into effect on March 1, requires that every big construction project be government approved before it is started. Import permits will be given such projects as low cost housing and industrial developments capable of earning U. S. dollars, but a government spokesman warns that "Much of our current investment for commercial, office, service and amusement purposes can and must be deferred."

In the past, Canada depended on her trade with Britain to earn the American dollars needed to offset her deficit trade balance with the U. S. This triple play has been broken up by Britain's dollar shortage at the very time Canada's investment boom in new construction and equipment has involved unprecedented imports of U. S. goods.

The Marshall Plan may provide a short term solution, but ultimately Canada's exchange problem must be solved by better use of the country's basic materials, such as steel, and by a substan-

(*Continued on page 160*)

Get Busy WITH A BRASCO FRONT



Architects: Sidney H. Morris & Associates, Chicago

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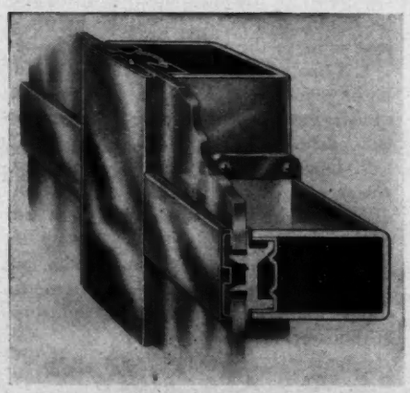
Safety-Set assures maximum visibility with its extremely low sash height. Heavy-gauge, steel reinforced construction provides ample strength and support for heightened areas and larger glass loads. Our new and exclusive FINGERTIP SETTING affords best protection against breakage because the glass is held firmly and safely without screws or pressure devices.

Wide choice of attractive sash and sill combinations permits authentic and detailed interpretation of the most advanced designs with standard stock members. In stainless steel or anodized aluminum, Safety-Set Construction builds store fronts of distinctive individuality . . . builds them soundly, artistically and economically.



Horizontal division bar used with vertical division bar to divide show window openings into multiple lights.

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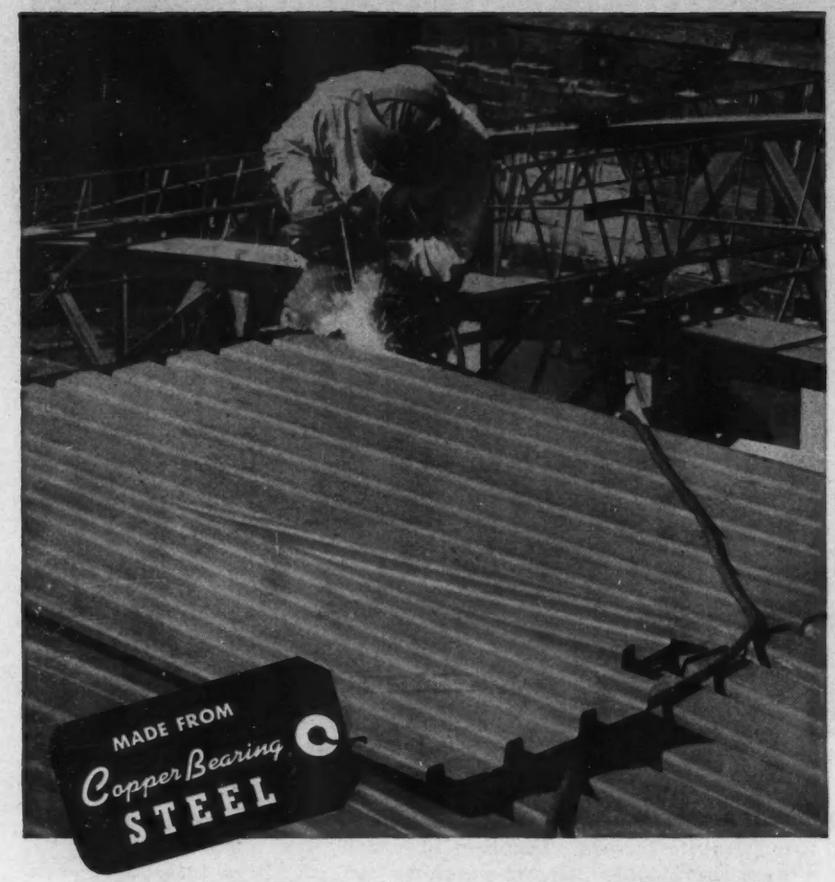

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STANDARDIZED STEEL BUILDING PRODUCTS

THE RECORD REPORTS

(*Continued from page 158*)

tial increase in Canadian exports to the U. S., the Americas, and other hard currency areas.

INDUSTRY NEWS SOURCE

Formation of the Construction Industry Information Committee, which will undertake to inform the public about the performance and progress of the building industry, has been announced by David S. Miller, president of the Producers' Council. Melvin H. Baker, president of the National Gypsum Co., Buffalo, has been appointed chairman.

"More than 130 individual companies engaged in the manufacture of building materials and equipment are participating in the program," Mr. Baker said. In addition, other branches of the industry will be asked to cooperate in the program so that the facts developed may reach the maximum number of people.

The Committee has engaged economic and public relations counsel, and will maintain offices in Washington, D. C.

A.I.A. WORKING ON HOUSING EMERGENCY

The Board of Directors of the American Institute of Architects has adopted a four-point program designed to meet the housing emergency.

The program calls for an intensive program of apprentice training, gradual elimination of rent control, a conversion program to increase the number of rental units in existing structures, and a two-year publicly financed housing program. The Institute further recommends that the publicly financed housing program be similar to the USHA public housing just prior to the war, except as follows:

1. Construction-cost limitations should be increased to allow the use of prewar physical standards at current construction costs.

2. During the period of the housing emergency, the equivalent elimination of substandard housing should not be required.

3. Control of planning and design as well as ownership and management should be vested in the local housing authorities.

P.C. AND A.I.A. RENEW AFFILIATION

The Executive Committee of the Producers' Council has approved a renewal of the Council's 26-year-old affiliation with the American Institute of Architects, under which the two groups will collaborate on technical programs designed to improve the quality and to lower the cost of construction.

(*Continued on page 162*)

ADDED COMFORT AND FUEL ECONOMY FOR SCHOOLS

WHO cares how hard Old Man Winter puffs and blows? Certainly not the occupants of a schoolroom with Syncretized Air. The frosty-bearded giant is always on the outside so far as they are concerned.

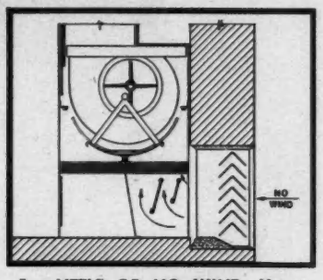
To the Nesbitt Syncretizer, with its thermal system of ventilation control, has been added a brand-new feature—the outdoor air-volume control. Long famous for its achievement of uniform temperature and the avoidance of chills and overheating through the harmonizing of air-stream and room temperatures, the Syncretizer is now equipped with the means of preventing an excessive quantity of outdoor air from entering the unit on windy days.

The new Nesbitt feature, exclusive and patented, operates through two pivoted vanes which, as the wind mounts in velocity, gradually restrict the area through which the outdoor air enters the unit. The opening which remains is not large enough to permit blow-through, but it is still ample to admit all the outdoor air required. The fuel saved on windy days makes the operation of the Syncretizer more economical than ever.

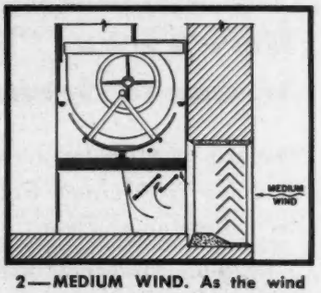
The Syncretizer Unit Ventilator is sold separately or in combination with Storage Units—and Convectors if desired—as a fully integrated assembly.
Send for Publication 249

THE NESBITT PACKAGE

Made by John J. Nesbitt, Inc., Phila. 36, Pa., and Sold by Nesbitts and American Blower Corporation



1—LITTLE OR NO WIND. Vanes lean only slightly in response to the mild current of air outside.



2—MEDIUM WIND. As the wind increases, the vanes begin to restrict the outdoor air opening.

3—STRONG WIND. About 75% of opening is shut off. Excessive amounts of outdoor air cannot enter.

The Committee also approved five other programs which the Council and its local chapters will develop during the coming year. According to a report by A. B. Meyer, president of the Council's New York chapter, these are:

1. Expansion and further development of the program of modular coordination with the aid of a special technical consultant.

2. Further development of the Industry Engineered Housing program with respect to engineering details.

3. Application of the principles of industry engineering to multiple rental housing, in cooperation with other industry branches, as a means of introducing into rental construction the same general economies as have been demonstrated in the engineering and design of individual homes.

4. Active support for the research program to be conducted by the Building Research Advisory Board, which has been officially endorsed by the Executive Committee.

5. Continuation of efforts to modernize restrictive building codes.

LE CORBUSIER EXHIBIT OPENS IN BOSTON

An exhibition of Le Corbusier's work now on view at the Institute of Modern Art, Boston, Mass., is exceptionally wide in its scope.

According to James S. Plant, director of the Institute, the material has been chosen "with a view to making clear Le Corbusier's role as a great innovator in modern painting as well as in architecture. In common with the six major U. S. museums whose collaboration will make the exhibition a national affair, we feel that Le Corbusier's contribution to architecture cannot be judged accurately without some appreciation of his role as a painter. We hope that out of the show will come a recognition of the unity of his painting, building, and city planning. We hope, also, to promote understanding of how Le Corbusier brought into architecture forms that he developed as co-founder, with Leger and Ozenfant, of French Purist painting."

LOW-COST HOUSING STUDIED

Mutually beneficial consultation between American countries on the common problem of low-cost housing is being fostered by the Pan American Union.

On the presses now is a comprehensive study of housing in Latin America by Francis Violich, formerly in charge of the Pan American Housing and Planning Information Service, which contains a general review of the problem as well as steps taken to meet the need.

Under the present guidance of Anatole A. Solow, the Service will release several new publications, including a bibliography on Latin American housing and planning, a listing of United States colleges which offer related courses and a statement of principles and basic standards which will define the goals of low-cost housing.

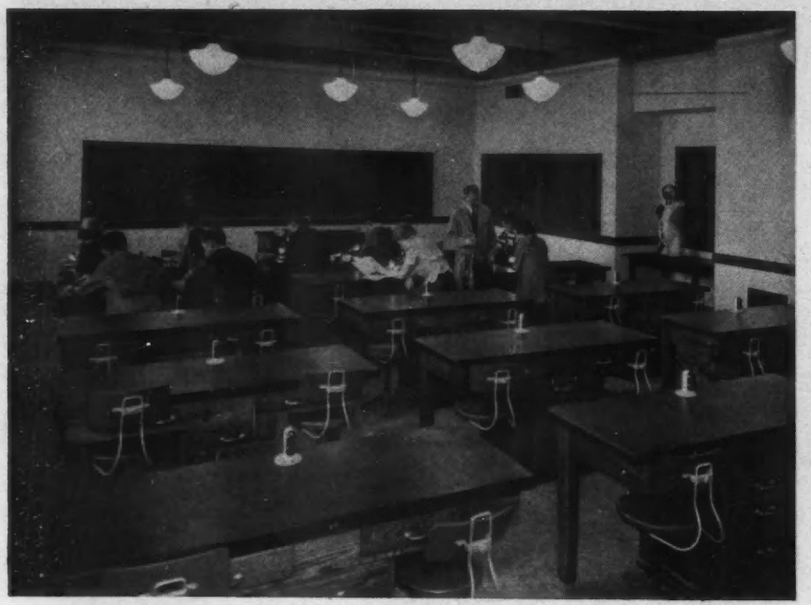
Inquiries regarding housing and planning information may be addressed to: Anatole A. Solow, Housing and City Planning Specialist, Division of Labor and Social Information, Pan American Union, Washington 6, D. C.

AT THE COLLEGES

New Courses

Heat Pumps: A new course concerned with heat pump design, application and theory, has been added to the curriculum of the New York University College of Engineering, New York City. The course, given at the graduate level, is conducted by Professor E. N. Kemler, Research Professor of Mechanical Engi-

(*Continued on page 164*)



Zoology Laboratory, Municipal University, Omaha, Nebr.

Here's what* "Kewaunee Equipped" *Means to Architects . . .

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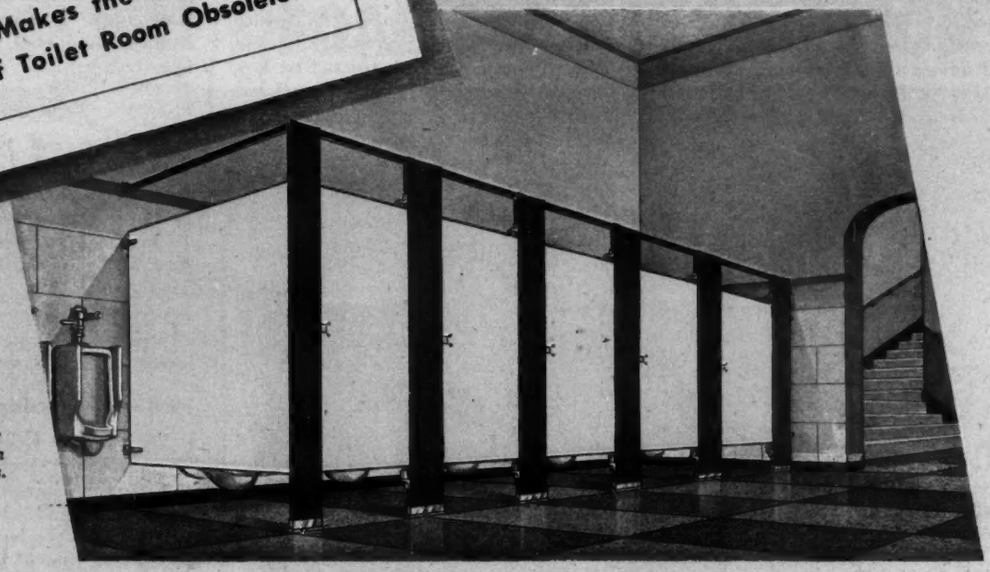
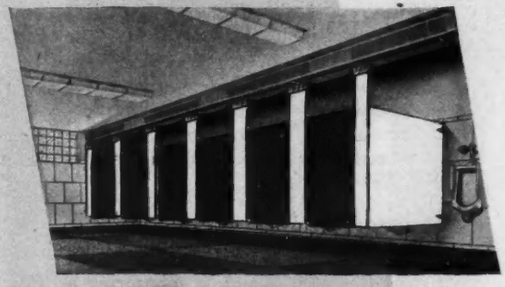
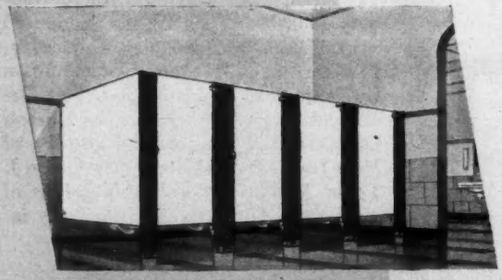


Sanymetal "PORCENA" ACADEMY Type Toilet Compartments are suitable for conservative but modern toilet room environments.

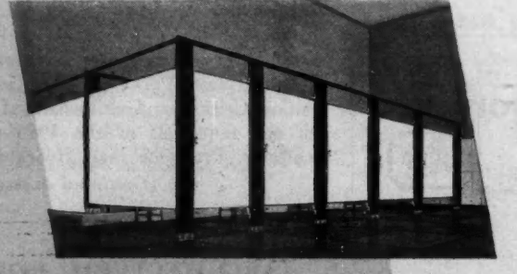
Sanymetal "PORCENA" CENTURY Type Ceiling Hung Toilet Compartments offer the utmost in sanitation and provide modern, distinctive toilet room environments for schools, institutions, terminals and other public buildings.



Sanymetal "PORCENA" NORMANDIE Type Toilet Compartments endow a toilet room environment with dignity and good taste.



Sanymetal "PORCENA" ACADEMY Type Shower Stalls and Dressing Room Compartments provide the utmost in sanitation for tourist camps, gymnasiums, clubs, Y. M. C. A.'s, etc.



● Simplicity, cleanliness and good taste will not be denied expression in building interiors of the future. Toilet compartments usually dominate a toilet room, influencing the toilet room environment.

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Sanymetal "PORCENA" Toilet Compartments combine the results of over 34 years of specialized skill and experience in making over 80,000 toilet room installations. Ask the Sanymetal Representative in your vicinity (see "Partitions" in your phone book for local representative) for further information about planning suitable toilet room environments. Refer to Sanymetal Catalog No. 19-B5 in Sweet's Architectural File for 1948.

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"PORCENA"

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TOILET COMPARTMENTS, SHOWER STALLS AND DRESSING ROOMS

neering and Assistant Director of Research of the College of Engineering.

Home Building: "A Practical Course for the Home Builder" is being offered to the general public through the Division of Short Courses, Institute of Arts and Sciences, Columbia University, New York City. Designed to extend professional advice to the layman, and conducted by Architects Harold R. Sleeper and Frederick J. Woodbridge, the 10-week course began on Feb. 5.

Housing and Light Construction: The new course in "Marketing and Management in Housing and Light Construction" now included in the curriculum of the City College Midtown Business Center, 430 West 50th St., New York City, is a direct result of the increasing demand for trained personnel in these fields. Sponsored and instructed by key business executives, the course is offered to evening as well as day students in order to prepare a maximum number of men and women for existing jobs in housing and light construction.

Industrial Design: The Division of General Education of New York University, Washington Square, New York City, is offering a course in "The Management of An Industrial Design Enterprise" to students and practitioners of industrial design or in related fields. The course consists of a series of 12 lectures conducted by key men in the industry.

Refresher Courses

Refresher and review courses, designed to prepare architectural candidates for Registration Examinations are part of the curriculum of the Federation Technical Institute, 5 Beekman St., New York City. Additional courses have been fashioned to give draftsmen, designers, etc., supplementary experience or training in the particular fields which interest them. Classes begin March 8.

McKim Fellowship Announced

The McKim Fellowship, open to all graduates of the School of Architecture of Columbia University who are American citizens and who have been graduated within the last 25 years, is to be awarded in June of 1948 and every third year thereafter.

The fellowship, which carries a stipend of $2000, is for the purpose of enabling the appointed recipient to carry out a definite and significant research project on a subject relative to architecture or city planning.

Persons interested in applying for this fellowship should write to the Secretary of the University, 213 Low Memorial Library, Columbia University, New York 27, N. Y.

Change of Speakers

The Princeton University Bureau of Urban Research, which is sponsoring a series of public lectures on "Cities in Transition" (see ARCHITECTURAL RECORD, Jan., 1948, p. 134) has announced a change in speakers for Wednesday, March 10th, at 7:45 p.m. The lecture on Governmental Problems of Urban Decentralization will be given by Joseph D. McGoldrick, former Comptroller of New York City rather than by Austin J. Tobin, Executive Director, The Port of New York Authority, as previously indicated.

Appointments

The College of Architecture and Design of the University of Michigan, has announced the appointment of Walter Sanders of the firm of Sanders and Malsin, New York City, as visiting Senior Critic in Architectural Design for the first half of the 1948 spring semester. Professor Jean Hebrard, for-

(*Continued on page 166*)

ATF Educational Planning Service . . .

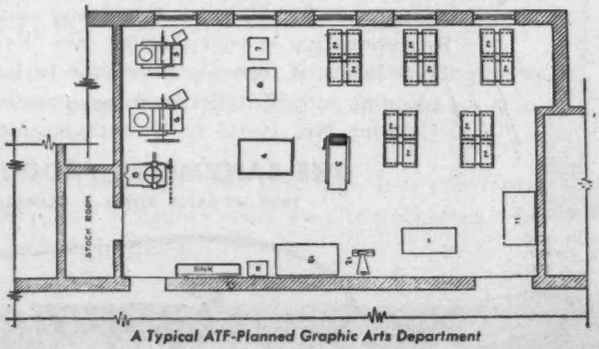
for School Architects and Administrators

A Typical Planning Committee at Work

The ATF Department of Education has assisted School Architects and Administrators for over 30 years in the planning of Graphic Arts Departments. This specialized engineering service is available without obligation to school officials and architects who are preparing new school building plans. • In the preparation of all layouts, due consideration is given to the correct location of the equipment to provide for maximum operating efficiency, correct lighting and pupil safety.

The following ideal room layouts complete with item specifications are available on request. Other special room layouts will be prepared when local conditions do not permit the use of these standard plans.

		Square Feet
Junior High		
6-J	6-10 pupils	528
12-J	12-15 pupils	840
15-J	15-19 pupils	960
20-J	20-24 pupils	1030
Senior High		
6-S	6-10 pupils	598
11-S	12-15 pupils	910
15-S	15-20 pupils	1040
20-S	20-25 pupils	1248
Vocational		
10-V	10-20 pupils	2240
15-V	15-20 pupils (Includes Offset Dept.)	3840
20-V	20-25 pupils	2968
25-V	25-30 pupils (Includes Offset Dept.)	4736
Teachers College		
20-TC	15-25 students	1430



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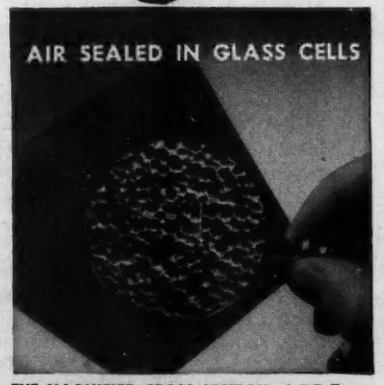

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When installed according to our specifications for recommended applications, PC Foamglas retains its original insulating efficiency permanently. It is highly resistant to moisture, fumes, vapor and acid atmosphere — elements that frequently impair the insulating value of other materials.

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FOR ADDITIONAL INFORMATION SEE OUR INSERTS IN SWEET'S CATALOGS.

mer Senior Critic in Design, retired at the close of the 1947–48 semester.

Henry L. Kamphoefner, former professor of Architecture at the University of Oklahoma, has been appointed first Dean of Architecture at North Carolina State College. The new School of Architecture and Landscape Design, which will be established on or about July 1, will be the College's fourth division. Schools are already maintained in agriculture, engineering and textiles.

Tau Beta Pi Honors Women

The Ohio State University Chapter of the exclusively male, honorary engineering fraternity, Tau Beta Pi, shattered all precedent by awarding merit badges to two women students during recent initiation ceremonies. The honored women, Dorothy E. Evans of Columbus, Ohio and Lucille F. DeChant of Toledo, Ohio, both seniors in the Department of Chemical Engineering, were cited for personal qualifications and scholarship.

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WRITE TODAY to the Metal Tile Products, Inc., Hastings, Michigan, for full information regarding the greatest and most durable Bathroom and Kitchen Tile that has been perfected as a result of wartime needs and research.

PANAMA CANAL STUDIED

The principal theme of the recent 95th Annual Meeting of the American Society of Civil Engineers in New York City, was the proposal, now being studied by Congress, to convert the Panama Canal into a sea level water route in order to protect it from atomic bomb attack and assure transit for much larger naval vessels than now exist.

Members of a special engineering committee, authorized by Congress to make a postwar study of "means for increasing the capacity and security" of the canal, presented first-hand accounts of the technical aspects of the study to a record audience of 2500.

Papers were presented on: "Investigation of Ship Performance in Restricted Channels," by C. A. Lee and C. E. Bowers, hydraulic engineers; and on "Traffic and Capacity of the Panama Canal," by Ralph P. Johnson, Corps of Engineers, Little Rock, Ark., and Sydney O. Steinborn, engineer in charge of the Special Engineering Division's traffic studies. Reports made by members of the Panama Canal Special Engineering Division were: "The Design of Channel for Sea Level Canal," by J. E. Reeves and E. H. Bourquard; "Flood Control for a Panama Sea Level Canal," by E. Stewart Brown and "Tidal Currents in a Panama Sea Level Canal," by Stuart Meyers and E. A. Schultz.

The proposed project would take an estimated 10 years to complete and cost approximately $2,483,000,000.

ELECTIONS, APPOINTMENTS

W. L. Cooper of Port Huron, Michigan, has been named vice-chairman of the Executive Council of the Realtor's Washington Committee. Chairmen also appointed to the council are: A. J. Stewart, treasurer, finance subcommittee; Fred C. Tucker, rent decontrol; Edward R. Carr, housing; Joseph Lund, taxation; Robert P. Constantine, slum elimination and urban redevelopment; Malcolm R. Prine, unemployment compensation tax; Ben Schlossberg, surplus property and William D. Davis, agricultural affairs.

Richard E. Dougherty, vice president of the New York Central System, has been elected president of the American Society of Civil Engineers for 1948. Newly elected vice presidents are: Col. Carlton S. Proctor and John W. Cunningham.

The National Board of Trustees of the American Designers Institute has elected John Vassos of New York, president, and Ernest Swarts of Illinois, national vice president. Miss Ann Franke of New York and Lionel Algoren of Illinois were re-elected national secretary and national treasurer, respectively. The election of regional vice presidents

(*Continued on page 168*)

14-Story Structure Erected Speedily, Quietly by Arc Welding

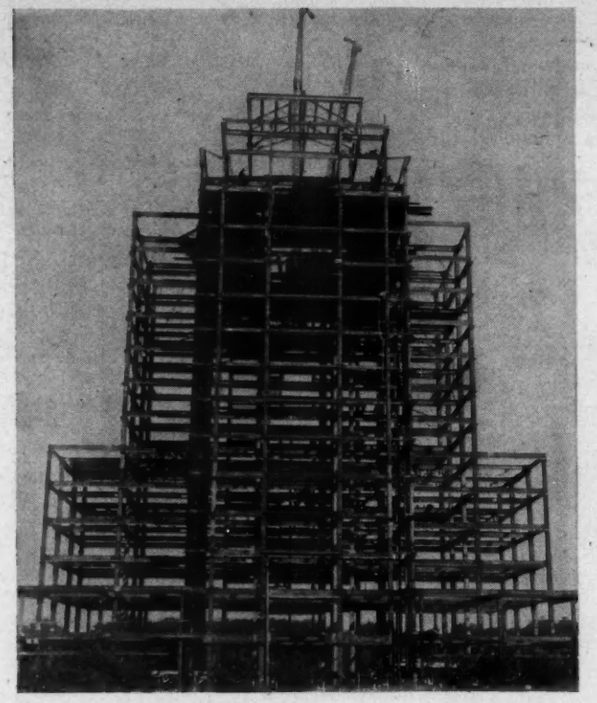


Fig. 1. All-welded structure of Hermann Professional Building.

By John R. Long, Mgr.
Houston Sales Office, Consolidated Steel Corp. of Texas
Orange, Texas

ONE of the tallest structures ever erected by arc welding is the Hermann Professional Building, a unit of the new Texas Medical Center under construction in Houston, Texas. The building is 14 stories with an additional first and second penthouse and hipped roof.

The 1400-ton structure (Fig. 1) was completely erected in 60 working days which is considered excellent speed for a building of this size and type. Considerable saving in steel tonnage was realized due to the structure's welded design. Eleven welders used approximately 40,000 pounds of Lincoln "Fleetweld 5" electrode for shop and field welding.

This is one of the first buildings of its type erected in the South, and exemplifies the rigidity and solidness of arc welded structures. There are 57 columns which, when set, were found to join perfectly.

Fig. 2 shows a connection from the spandrel beam to the corner column. Due to the flange connection, stiffener plates were required in the web and since the spandrel beam was centered on the flange of the column, the stiffener plate acts as a connection plate for the spandrel. Their entrant cut was necessary due to pipe chases in the floor.

As shown in Fig. 3, the column at the corner of the elevator opening is the only portion of the structure where cross-bracing was employed. It shows a typical connection of one of the many beams throughout the job that were offset from the center line of the columns. Due to the various types of conditions, a design was made of each connection and drawn in detail before any structural detailing was started. This enabled us to design nearly all connections for downhand welding. A welding sequence was employed throughout erection which proved economical in the fact that none of the structure had to be replumbed after welding had been completed. Engineers checked each column with a transit, and the column corners showed no more than a $\frac{1}{8}$" variance from top to bottom.

The architect firms which had joint responsibility for this job and the erection sequence are Hedrick & Lindsley and Kenneth Franzheim, both of Houston. The general contractor is Linbeck & Dederick Construction Co., Houston, and the Consolidated Steel Corporation of Texas is the fabricator and erector.

Conspicuous by its absence on this job was the noise usually associated with structural work. Silent erection, one of the advantages of arc welded structures, is particularly important in areas where quiet must be maintained.

Fig. 2. Welded connections are simple in design. Bolts serve only to hold plates in position for welding.

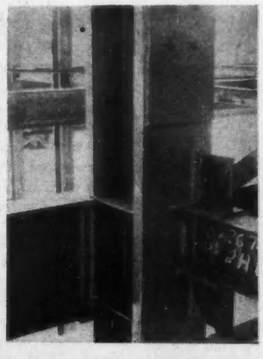


Fig. 3. Corner of elevator opening showing only place where cross-bracing is employed.

The above is published by LINCOLN ELECTRIC in the interests of progress.
Structural Design Studies are available free to architects and engineers. Write The Lincoln Electric Company, Dept. 171, Cleveland 1, Ohio.

was: Miss Ruth Gerth, West Coast; Harold Reynolds, Chicago and Robert Thompson for the South.

OFFICE NOTES

Offices Opened

The William L. Crow Construction Co. has opened a new branch office in the Washington Bldg., Washington, D. C., and one at 357 West Fayette St., Syracuse, N. Y. John J. White, Jr., has been placed in charge of the Washington office and Joseph P. Comeau will manage the Syracuse branch.

L. Robert Gardner, Architect, has announced the opening of an office for the practice of architecture at 173 South 2nd West, Cedar City, Utah.

Walter M. Laitala and Wilmar F. Nuechterlein have announced the formation of the firm of Laitala and Nuechterlein at 620½ W. Saginaw St., Lansing 15, Mich.

Louis A. Oliver has announced the opening of an office for the general practice of architecture at 823 W. 21st Street, Norfolk, Va. Herbert L. Smith, 3rd, is associated with him.

Robert L. Strelitz, A.I.A., has opened an office for the practice of architecture at 1475 Irving St., N. W., Washington 10, D. C.

Warren Weber, A.I.A., has opened offices in the Fenton Bldg., Portland 4, Ore.

New Addresses

The following new addresses have been announced:

Theodore R. Earne, Architect, 40-20 Main St., Flushing, N. Y.

Eckbo, Royston & Williams, Planning Consultants and Landscape Architects, 4115 W. 3rd St., Los Angeles 4, Calif.

Koblik and Fisher, Architects (temporary), at 917 7th St., Sacramento, Calif.

J. Mandor Matson, Architect, 610 Main St., Racine, Wis.

Gerald Anthony Paul, Architect, 140 E. 44th St., New York 17, N. Y.

Slocum and Fuller, Consulting Mechanical Engineers, 714 Fifth Avenue, New York City.

Firm Changes

Robert L. Brown, A.I.A., and William G. Wells, A.I.A., have opened an office for the practice of architecture and architectural engineering under the firm name of Brown & Wells, P. O. Box 1205, Roanoke, Va.

Robert H. Fuller has joined the H. K. Ferguson Company, Industrial Engineers and Builders, as a contract engineer in the Eastern district, with headquarters at the firm's New York offices.

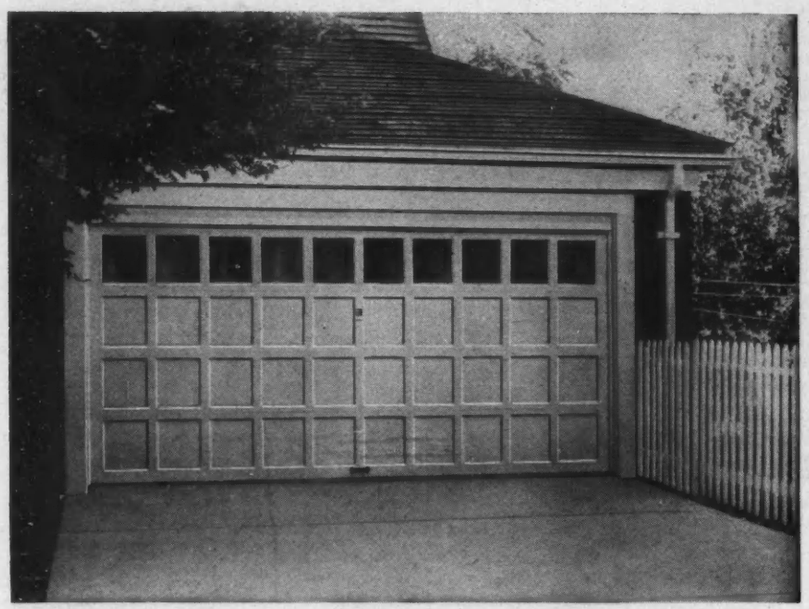
Ernest R. Gilbert, A.I.A., has joined the firm of Marcellus Wright & Son, Architects, at 1103 E. Main St., Richmond 19, Va.

Paul Harris, Architect, and Marvin Frank, Architect, have formed a partnership under the firm name of Harris & Frank at 4122 Maple Ave., Dallas 4, Texas.

H. Evert Kincaid, George A. Hutchinson and Leonard Downie have announced the formation of "Community Planners," which will handle all land planning and development for the John Galbreath Co., with whom the new firm will share offices at 111 W. Washington St., Chicago 2, Ill.

Ernest J. Smith, M.R.A.I.C., Dennis H. Carter, M.R.A.I.C., and Walter L. Katelnikoff, M.R.A.I.C., have formed the firm of Smith, Carter, Katelnikoff with offices at 2892½ Garry St., Winnipeg, Canada.

Leslie Williams and Charles M. Upham, Jr., have announced the establishment of a Sustained Advisory Service on Traffic and City Planning Problems at 292 Madison Ave., New York. The firm will be known as Williams & Upham.



IT'S A GOOD IDEA TO USE
D-O-U-B-L-E W-I-D-T-H
Barcol OVERdoors
FOR TWO-CAR GARAGES...

NO CENTER POST. When planning the doors for a two-car garage (either new construction or remodeling), a double-width Barcol OVERdoor offers several worthwhile advantages. The center post is eliminated, amount of door mechanism is reduced, and appearance is better, especially for long and low structures.

EASIER, SAFER DRIVING. With the center post gone, it is a lot more convenient to get cars in and out, particularly if a turn near the door is involved. Clearances are greater, and the chances of colliding with the door frame are reduced. With the present trend in auto design, this is a considerable help.

ELECTRIC OPERATOR. More and more, electric door operators are being used in residence garages. A double-width door offers a saving here, because only *one* operator is needed. It is not mandatory to use an electric operator with a double-width Barcol OVERdoor since tailored counterbalancing makes it easy to handle. For installations with electric operators, the Barcol Radio Control gives the final touch of convenience — control of the door *by radio* from the car! Write for information on all Barcol products, or ask your Barber-Colman representative for details.

SEE OUR CATALOG IN SWEET'S

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BARCOL
BARBER-COLMAN COMPANY
102 MILL ST. • ROCKFORD, ILLINOIS

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Stainproof Wall Covering

is important to Architects:

Because it's stainproof beyond any other wall covering ever created, resisting stains of *all* kinds from public or private wear... Resists fire, too!

Because it's durable and comes up smiling-fresh after 25,000 soap and water washings... over 20 years' normal care! Varlar's stainproofness *completely* penetrates and lasts for life.

Because it's beautiful with stunning new tone depths achieved by an entirely new process giving rich, warm hues... The coloring is built from the ground up... *goes clear through*... not just a surface coating.

Because it's versatile, offering a complete line of 92 handsome styles suitable for lasting, satisfying use in every room or passageway... public or private, domestic or commercial.

Because it's available now with all 92 styles in full production to supply the demand for this completely new, revolutionary wall covering medium of enduring beauty.

SEE AND TEST VARLAR YOURSELF... FREE! Splatter, smear, write on, even walk on amazing Varlar... and watch it come clean with soap and water. Send this coupon for your free sample.

VARLAR INC.

DIVISION OF UNITED WALLPAPER INC. CHICAGO

SEE FOR YOURSELF... FREE!

VARLAR, INC., Dept. D-38
Merchandise Mart, Chicago 54, Illinois

Sounds good—but I've got to be shown. Send my FREE Varlar Sample and I'll see it, test it for myself!

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IT DIDN'T WORK IN CANADA

By John Caulfield Smith

Introduction of a yield insurance program to be administered by FHA is proposed by the Taft-Ellender-Wagner bill. Is such a measure likely to encourage the building of moderate rental housing? Canada's recent experience with yield insurance indicates that it is not. Not, at least, at present.

The event leading to adoption of a yield insurance program occurred in 1944. In that year the Canadian government passed the National Housing Act, authorizing approved lending institutions to invest in rental housing. The intention was to tap the investment funds of Canada's life insurance companies. Conservatively managed and closely supervised, these firms enjoy an unexcelled reputation for safety. They represent the country's largest source of

Housing Enterprises project in Hamilton, Ont., consists of 116 detached and semi-detached houses of four to six rooms each

first mortgage money, but until 1944 were prohibited from owning real estate other than that required for carrying on their business.

The life companies hadn't sought the change in regulations. Many insurance executives doubted the advisability of their firms assuming the functions of building promotion and management. Others felt rental housing might offer opportunities for profitable investment, but were opposed to putting money into such projects during an inflationary period.

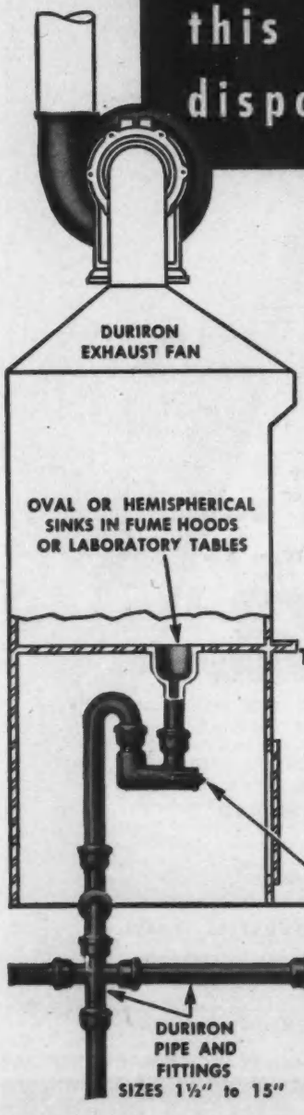
No move was made to employ the new legislation. Then suddenly, in 1945, the war ended. It was obvious that discharge of hundreds of thousands of service personnel would soon aggravate the already serious housing shortage. The government hit on the idea of yield insurance as a means of getting rental housing built. Representatives of the life companies were quickly summoned to a meeting. They were told that if they would combine to organize a limited dividend housing corporation, and give veterans preference as tenants, the government would not only guarantee the safety of their invested principal, but insure them a return on it.

The companies hesitated. They were being asked to do something in which they not only lacked experience but which, till only a year before, they had been prohibited from doing! At the same time they wanted to cooperate in any practical effort to solve the housing problem. They decided to accept the government's yield insurance offer.

Shortly afterward, the National Housing Act was amended to permit the companies to form a limited dividend housing corporation. Known as Housing Enterprises of Canada Ltd., it planned to make an initial investment of $50,000,000 in rental housing. Of this sum, 10 per cent was raised through sale of corporation debentures to the life companies. They bought them in amounts proportionate to their Canadian assets.

(*Continued on page 172*)

WHY CORROSION CAN'T DESTROY this laboratory waste disposal system


DURIRON EXHAUST FAN
OVAL OR HEMISPHERICAL SINKS IN FUME HOODS OR LABORATORY TABLES
SINK STRAINERS IN LAB. SINKS
DURIRON CENTRIFUGAL DRUM TRAPS
DURIRON PIPE AND FITTINGS SIZES 1½" to 15"

The sinks, strainers, traps, pipe, fittings and fume exhaust fan in this chemical laboratory corrosive-waste disposal system are made of Duriron. The high silicon iron composition of Duriron gives it a wider range of corrosion-resistance than any other commercially available alloy. Duriron can be expected to outlast the building.

Some other cost-reducing advantages of this high silicon iron are: Uniform corrosion-resistance through entire wall thickness; no lining to chip, spall or crack . . . abrasion resistance . . . will not warp or sag from heat.

For complete details of Durco products for the chemical laboratory, write for new bulletins 703 and 1102.

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Branch Offices in Principal Cities

DURIRON ACID PROOF DRAIN PIPE

52-GM

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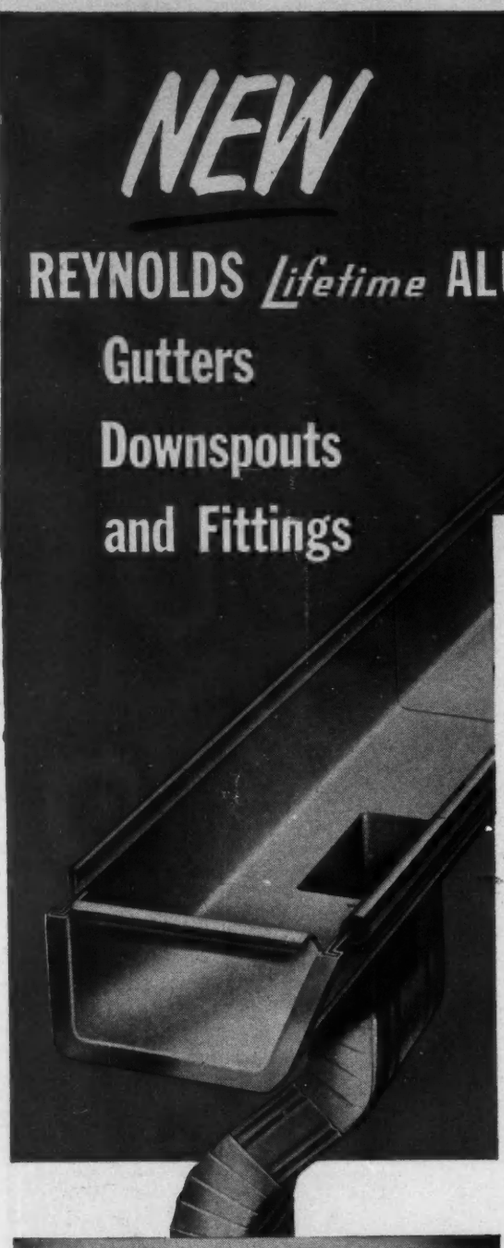
Gutters
Downspouts
and Fittings

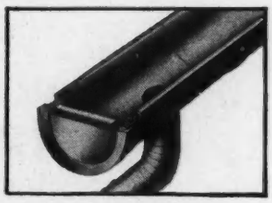


Rust-proof, stain-proof, lightweight, needs no painting! In round or Colonial box design

Aluminum is a "natural" for rain-carrying equipment ... the only comparable rust-proof material used in the past is hard to get at nearly *twice the price!* And Reynolds, biggest name in aluminum building products, now brings you a choice of design ... round or Colonial box type.

Both styles are 5" across top, come in 10' lengths, with slip-joint "S" connectors—no soldering. Weight, less than 3¼ lbs. per length. Conductor pipes are available in 3" plain round, 3" corrugated round and 2" x 3" square corrugated. Fittings include inside and outside mitres, trough section with drop, end caps, hangers, elbows.

It's what your customers will want. See your supplier now. Write for literature. Reynolds Metals Company, Building Products Division, Louisville 1, Kentucky.



NEW... for longer roof life, lighter roof load, cooler buildings in summer

REYNOLDS *Lifetime* ALUMINUM BUILT-UP ROOFING

.004" embossed aluminum that rolls in as easy as felt, bonds firmly, seals in the life of asphalt by sealing out air, light, moisture. Saves 400 to 500 pounds per square compared with slag or gravel dressed roofs. Reflects sun heat—to keep interiors up to 15° cooler. Rolls 36" wide, contain 10 squares, weigh about 60 pounds. *Ideal for re-caps, a world of new business!* Write for specifications on 2- and 3-ply new roofs and re-caps.

IF YOU SEE RUST YOU KNOW IT'S NOT ALUMINUM

REYNOLDS *Lifetime* ALUMINUM BUILDING PRODUCTS

REYNOLDS PIONEERING MADE ALUMINUM COMPETITIVE . . . *TAKE ADVANTAGE OF IT!*

WORLD'S LARGEST PRODUCER OF ALUMINUM BUILDING PRODUCTS:
Aluminum Shingles • Clapboard Siding • Sheet Roofing & Siding • Eaves Trough & Conductor Pipe • Ceiling Panels
Wall Tile • Windows • Garage Doors • Reflective Insulation • "Alumi-drome" (Farm and Commercial Utility Bldgs.)

IT DIDN'T WORK IN CANADA (*Continued from page 170*)

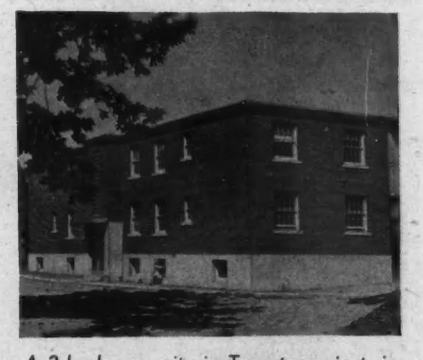
The remaining 90 per cent was provided by a government loan bearing 3 per cent interest. The government set a limit on the corporation's earnings of 5 per cent and guaranteed it a return of 2½ per cent.

Housing Enterprises functioned as a holding company. Separate operating companies were formed in each community where projects were built. The first year's program — that of 1946 — called for erection of 6000 dwelling units in 38 different cities and towns. Private architects were employed in many cases, but the operating companies let their own contracts. A few of these were on a lump sum basis, with appropriate escalator clauses, but most of them were aimed at a target price. They offered the builder a small bonus if final costs were less than anticipated. There was no penalty if anticipated costs were exceeded.

Unfortunately, no sooner had actual building started than the government decided to abandon its construction control policy. The effect of this action was felt almost at once. Although Housing Enterprises enjoyed top priority as regards labor and materials, these essential ingredients for a construction program were not forthcoming in sufficient quantities. Competition from less essential building was too keen. The delays which resulted were expensive. It soon became apparent that prices would go beyond the desired targets.

The corporation curtailed its 1946 program, but optimistically prepared plans for 1947. However, the tenders received on the new projects made it abundantly clear that the cost of construction would not permit moderate rentals to be charged. Moderate, that is, in the sense Canadians had been led to regard Housing Enterprises rentals. They invariably thought of them in terms of rentals at which existing equivalent accommodation had been frozen early in the war.

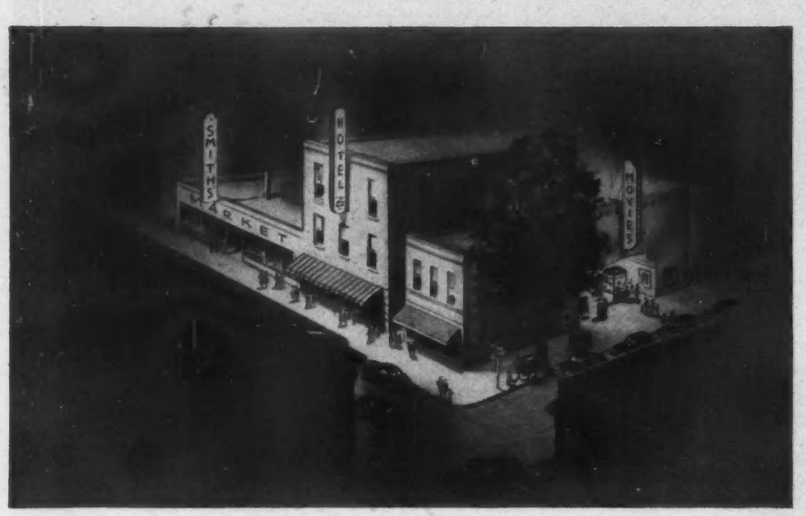
Typical Housing Enterprises apartment unit shows careful planning, nice detail



A 3-bedroom suite in Toronto project, intended to rent for $54 monthly, had rent forced up to $95 by high building costs, and cut to $77 when government took over

If moderate rental housing could not be provided for veterans and their families, Housing Enterprises was not achieving the purpose for which it was

(*Continued on page 174*)



How much air at 4th and Main?

You can't afford gold-braided doormen for that store at 4th and Main. No luxurious "extras" of any kind.

And yet you know, from costly experience, that air conditioning for this store is a *must*. You know that next summer will be hot and sticky . . . that shopping is wearying work . . . and that women will give their patronage to stores and shops that are comfortably cooled.

So it isn't a question of *whether* you need comfort cooling at 4th and Main. The question is: How much can your store afford?

USAIRCO has the profitable, business building answer in its 3 great comfort cooling systems . . . each a pre-engineered package unit . . . each available in a variety of sizes to meet any requirement.

Refrigerated Kooler-aire delivers the ultimate in air conditioning . . . *Cold Water Kooler-aire* is designed for those locations where 55° water is available . . . *Evaporative Kooler-aire* gives washed and filtered air cooling at *"pennies-a-day"* costs. USAIRCO co-operating engineering counsel is available for correct installation.

Would you like to see exactly what these systems are and what each one can do for you? Write and we'll send you all the facts.

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3 COMFORT COOLING SYSTEMS . . . AT 3 BUDGET LEVELS

The Name **HOPE'S** *Guarantees*

1818 WINDOWS 1948

Residence of Architect Hugh Stubbins, Jr., Lexington, Mass.

IN this house, HOPE'S STEEL WINDOWS help accomplish the purpose of merging indoor and outdoor living in summer . . . and by their trustworthy weather-tightness, giving full protection in winter.

The versatility of Hope's Windows helps the architect reach the best solution of the problem of fenestration in any type of building. Their practical advantages, structural strength and rigidity, durability and dependable operation, give the greatest assurance of success in the use of large glass areas.

HOPE'S WINDOWS, INC., *Jamestown, N. Y.*

THE FINEST BUILDINGS THROUGHOUT THE WORLD ARE FITTED WITH HOPE'S WINDOWS

IT DIDN'T WORK IN CANADA (*Continued from page 172*)

created. Realizing how disappointing this news would be to the public, the life companies decided to offer the corporation to the government.

The offer was accepted. The government possibly reasoned that under the circumstances paying a return to the companies would amount to subsidizing high rental housing. Such a policy might have serious political consequences. The money for the subsidy would have to be raised by taxes, yet many taxpayers would be the very people who, inadequately sheltered, most needed moderate rental housing! Obviously it was more expedient to indirectly subsidize rents, if necessary, as a public responsibility, rather than pay a direct subsidy to a private enterprise.

In reaching this conclusion, the government was influenced by its possession of administrative machinery to manage the projects built and building. Central Mortgage and Housing Corporation, its agency in the housing field, already looked after 25,000 wartime houses and could easily take over the program of Housing Enterprises. The charter of the life companies' limited dividend corporation was therefore transferred to Central Mortgage, and the debentures purchased by the companies were redeemed.

Altogether a total of 3300 dwelling units were constructed by Housing Enterprises. Of these 3000 are completed and occupied. Building types vary from apartment houses to detached, semi-detached and row houses. The possibilities of prefabrication were explored to some extent, but the experiments conducted were not sufficiently large in scale to indicate any substantial saving over conventional techniques. The gap left by Housing Enterprises' withdrawal will be filled by the government's direct participation, through Central Mortgage, in a new program of rental housing construction.

Canada's experience shows that in an inflationary period like the present, a yield insurance program cannot encourage the building of moderate rental housing. The existence of such a program in no way affects the impossibility — or near impossibility — of producing such housing. Construction costs necessitate that economic rents for new accommodation be high in relation to rents at which comparable existing accommodation is frozen. But in a deflated, or even a stabilized period, the results of a yield insurance program might be far more favorable.

Housing Enterprises typical row housing (above), typical detached house (below)

SPECIFY Satisfaction

WITH Amtico RUBBER TILE

When you specify Amtico Rubber Tile, you are putting your client's best interests first. It will give many years of hard service and its gleaming surface is easy to maintain. Its beautiful colors go all the way through; there's no danger of marring from wear or cigarette burns. It's so satisfying to walk on — quiet and resilient underfoot.

Lustrous beauty is there, whether for an auditorium or just a powder-room, and its ability to wear and wear makes it the number one material for floors.

With thirteen beautiful, marbleized colors at your command, you have an almost unlimited palet to use in creating distinctive and unusual designs. Write for literature and samples. You'll please your clients, and add to your reputation for knowing the best the market offers.

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Foot of Perrine Avenue, Trenton 2, N. J.
Send samples and illustrated folder showing Amtico Rubber Tile in colors.

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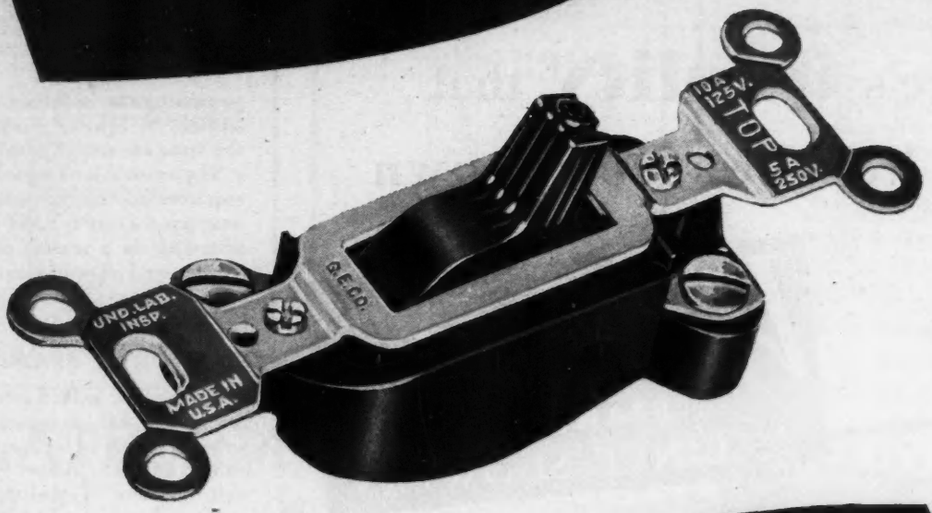
Manufacturers of "AMTICO" RUBBER TILE FLOORING—Marble & Terrazzo Effects, "AMTICO" SHEET RUBBER FLOORING—By the Roll, Plain and Marbleized Colors
RUBBER MATS & MATTING—Plain & Designed Effects. RUBBER STAIR TREADS AND NOSINGS

Silent



10 amperes

Sure, selling a top-quality wiring job is a tough deal when clients can't tell an ampere from an ohm. But here's a brand-new focal point for your "better wiring" specifications – silence and smooth action – *features that can be demonstrated!*

With its new 10-ampere, 125 volts, T-rating, this new mercury switch opens up new fields for silent switch applications, matches quiet operation to today's heavy loads. It's a long-life, specification-grade switch, made well to do its job well – *another G-E first* – to help make good wiring better.

And, when you're specifying high-quality wiring, remember the power of the General Electric name. It identifies a complete line of wiring devices which your clients know they can trust. Ask your General Electric merchandise distributor about the new mercury switch and the rest of this complete line. Section D2-35, General Electric Company, Bridgeport 2, Connecticut.

GENERAL ELECTRIC

(*Continued from page 149*)

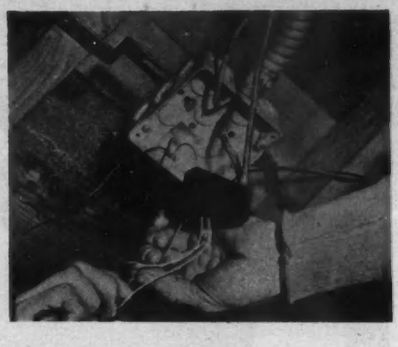
the dimensions appearing on a dial, the right side of which is used for adding and the left for subtracting. Results of the completed calculations are given in decimals as well as fractions. Elemoto Sales Co., P. O. Box 62, Teaneck, N. J.

LOW VOLTAGE CONTROL

Safety and flexibility are the keynote of the *Saflex Low Voltage Control Relay System*, as the name implies. According to the manufacturer:

The safety feature lies in the use of a 24-volt system for switches throughout the room, operating the main 120-volt switch through a magnetic relay hidden in the main circuit fixture box.

The flexibility comes from the use of wire instead of conduit — the wire, running from the outlet fixture box to the control switch, can be installed in many places where heavy conduit would not be feasible; and furthermore, the wire is less expensive than the conduit,



Installation of magnetic relay at point of use for single control point in low voltage system using wire instead of conduit

permitting the installation of a greater amount of lighting control points for the same amount of money.

The system is designed to meet the requirements of the adequate wiring program for safety, and to be readily adaptable to a master control system which would allow any number of rooms to be lighted from a single switch. Square D Co., Los Angeles, Calif.

STEEL DOOR FRAMES

A one-piece, welded steel door frame, the *Aetna FR*, designed for low-cost housing, is said to be completely standardized and to fit almost every standard wall thickness. Welded to form a complete, integral unit of jamb, head and two sides of trim for strength and rigidity and fast installation. Products Corp., 61 Broadway, New York, N. Y.

VINYL COATING

A new vinyl resin coating called *Amercoat No. 88* is said to resist most dilute acids and to be unaffected by alkaline cleaning compounds used as detergents. As it is a pigmented vinyl resin dispersed in water, it has no unpleasant odor either during or after application. Other advantages claimed include complete resistance to water and weather, exposure to all animal and vegetable oils, bacteria, mold and fungi. Designed to be either brushed or sprayed over concrete, masonry or wood surfaces. Available in white, solid colors and selected pastel shades. Dept. AR, Amercoat Division, American Pipe and Construction Co., P. O. Box 3428, Terminal Annex, Los Angeles 54, Calif.

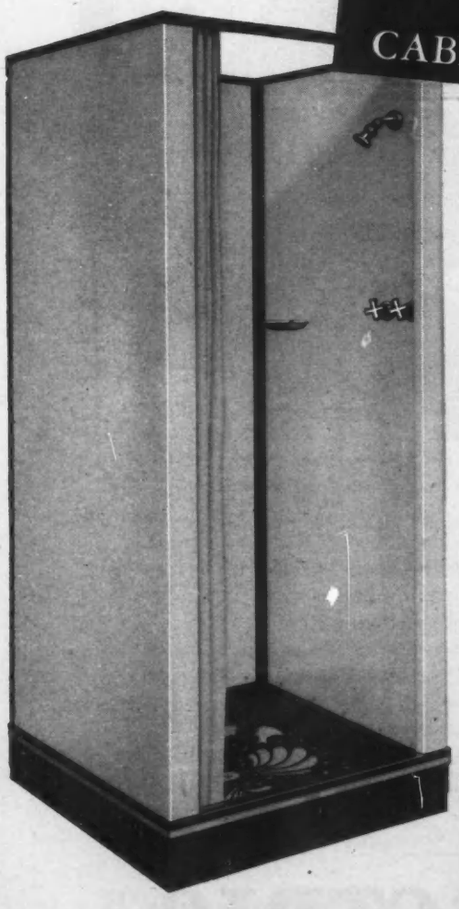
WEATHERPROOF FLOODLIGHT

An aluminum floodlight, claimed to be weatherproof, has a housing spun from one piece of sheet aluminum and a convex heat-resisting glass lens. Available in 200 to 1000 watt sizes. Lens diameters range from 8⅜ to 11¾ in. Pittsburgh Reflector Co., Oliver Bldg., Pittsburgh 22, Pa.

(*Continued on page 178*)

Here's **Quality** that Will Not Let You Down

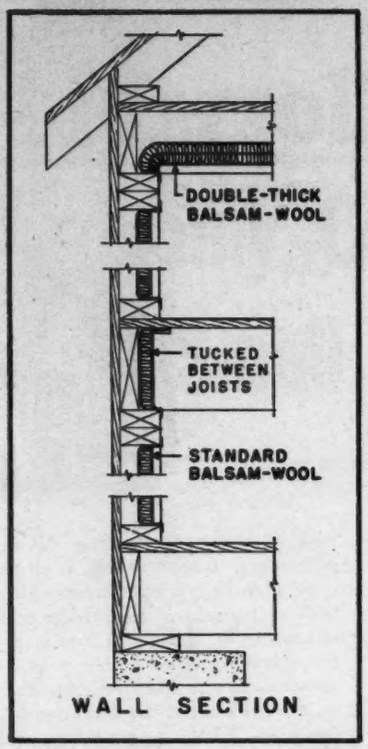
Weisway
STANDARD
CABINET SHOWERS

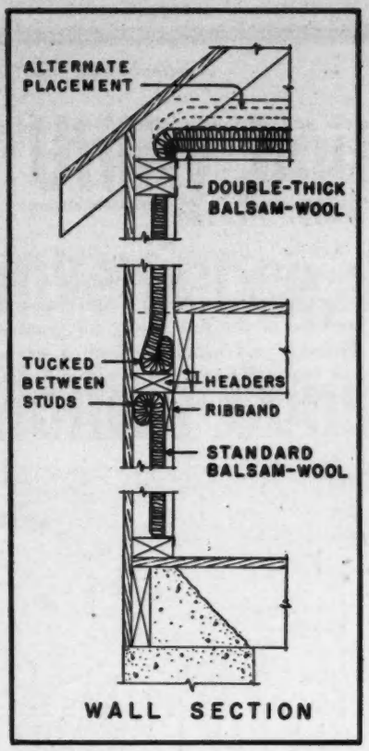


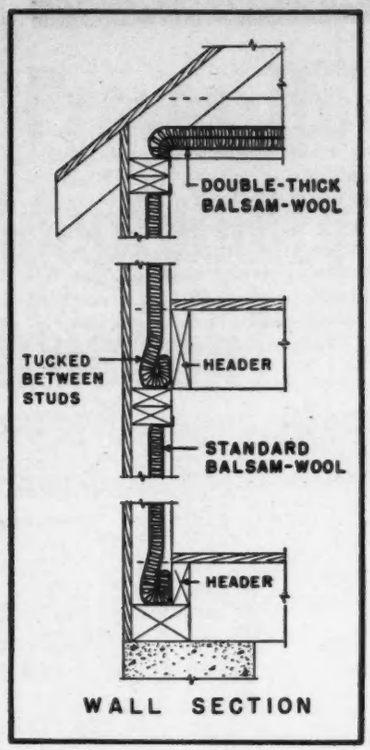
Installation photo shows corner entrance model with in-a-wall adapter

Precision built of service-tested materials, the Weisway Standard model meets the quality requirements for master bathrooms or extra baths in homes of every size and type, as well as for hotels, clubs, apartments, hospitals, schools and public buildings. Walls are 14 B & S gauge aluminum alloy finished white baked-on enamel. Receptor of Armco Iron, one piece, vitreous porcelain enameled, jet black with Foot-Grip, No-Slip floor in textured green sea shell pattern. Available promptly, through established plumbing channels. Write for details.

HENRY WEIS MFG. CO., INC.
303 Weisway Building, Elkhart, Ind.





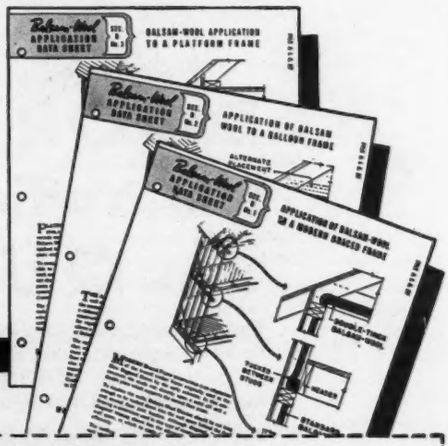


PLATFORM—BALLOON or BRACED

Balsam-Wool has the Insulation Answers!

• No matter what the type of construction, Balsam-Wool provides the *sure* way to insulate. Its method of application and special features assure a *lasting* insulation job—windproof, moistureproof, highly fire retardent and non-settling.

To place insulation application data at your finger tips, Wood Conversion Company has developed a series of 32 Balsam-Wool data sheets, with carefully prepared drawings and explanatory text. You'll want a set of these sheets for your files—and it is yours for the asking. Just mail coupon!



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Please send me a set of Balsam-Wool Application Data Sheets.

Name.....

Address.....

City.....*State*.....

(*Continued from page 176*)

WINDOWS

A patented shutter-type window is now being offered for installation in house trailers, homes, office buildings, manufacturing plants, etc. Made of either metal or wood frames, the window is a series of glass shutters and operates by means of a worm gear. The design eliminates puttying and permits full ventilation at any time. Can be installed in existing structures or in new installations. Made to order with desired thickness and design of plain, structural or safety glass. D. I. Hite, 111 Line St., W. Columbia, S. C.

WATER HEATER

A new automatic oil-burning water heater has a low draft burner which concentrates a swirling action flame at the base of the flue casing for greatest efficiency and which rests on a screw-jack support to permit quick and easy lowering for serving. The "Magic Pilot," with in-built anti-flooding device, is guaranteed to burn evenly at all times, unaffected by variable drafts. All controls are completely enclosed to prevent tampering or accidental bumping and the unit is equipped with a magnesium alloy anode with special current-resistor to prevent electrolytic action, rust and corrosion. With automatic temperature control and Fiberglas insulation, the heater is available in 30 and 45 gal. capacities. J. L. Gillen Co., Dowagiac, Michigan.

Oil-burning water heater with low draft burner which keeps flame at base of flue

OUTSIDE TEMPERATURE CONTROLLERS

A fully modulating system of temperature control for commercial and industrial buildings has been developed to regulate inside temperatures in accordance with outside climatic conditions. Can be used with either hot water or steam heating plants. A control panel contains all adjustments for matching the heating system operation to the design temperature level. A reset controller, either included in the panel or mounted separately, sets the position of the pressure or temperature controller and regulates the heat input. The control panels are constructed on a custom-made basis to meet requirements of individual installations. Minneapolis-Honeywell Regulator Co., Minneapolis.

CEILING RECEPTACLES

At a price comparable to that for porcelain receptacles, a high-strength ivory bakelite keyless ceiling receptacle is offered for use with 3¼-in. and 4-in. round boxes. Designed with extra strong terminals to permit use with No. 10 aluminum or No. 12 copper wire, as required. Advantages claimed: lightness of weight and resistance to breakage and mechanical stresses. Slater Electric and Mfg. Co., 56th St. and 37th Ave., Woodside, N. Y.

(*Continued on page 180*)

The DOOR that lets traffic through ... QUICKLY

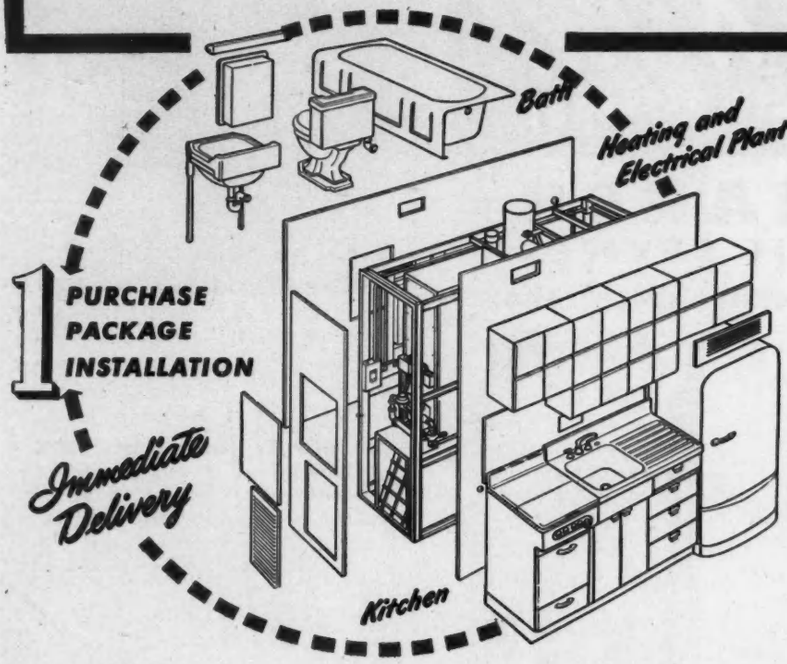
Easy opening — quick closing allows uninterrupted traffic flow regardless of wind and weather. Positive, effortless action is built into ELLISON the BALANCED DOOR, providing an installation that minimizes maintenance.

Ask about the space-saving features of the BALANCED DOOR.

Ellison the BALANCED DOOR

ELLISON BRONZE CO.
Jamestown, New York
representative in principal cities

Ingersoll Utility Unit Proves Its Economy, Convenience, Adaptability in Small Homes Construction!



The Ingersoll Utility Unit is a single, engineered assembly of the fixtures, appliances, controls and fittings of Kitchen, Bathroom, Heating Plant; plus all basic plumbing and electrical lines.

Ingersoll
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ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 178*)

PRIMING PAINT

An elastic priming paint, *Stainhold*, which is new in the general market, is said to act as a barrier to stains by completely sealing the surface with a coating which is unaffected by oil, grease, tar, asphalt and other bituminous coatings. It may be used directly over oil or grease spots to prevent stains or discolorations bleeding through the finish coat and may also be used as an undercoat on asphaltic roofs, shingles, etc. One coat, brushed or sprayed on, is normally sufficient to establish a prime coat, the manufacturers report. Four Square Paint Corp., Brooklyn 11, N. Y.

PLYWOOD

A new material to provide unusual effects for display backgrounds and interior decoration of stores, art galleries, offices, etc., is made of 1-in. jewel cut squares of plywood attached to a flexible fabric backing. Called *Checkwood*, this material may be formed into a variety of shapes, can be worked easily and is adaptable to both modern and antique decoration. It may be used on curved or flat surfaces. United Plywood Corp., 55 West 44 St., New York 18, N. Y., and The Mengel Co.

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1707 DIXIE HIGHWAY • LOUISVILLE 10, KY.

Protective coating for concrete, masonry or steel can be applied under water

PROTECTIVE COATING

A protective coating for concrete, masonry or steel is claimed to have excellent adhesion to wet or dry surfaces and to be applicable to underwater surfaces. Known as *Sika Seal*, it is not an emulsion, but a blend of specially treated asphalts, plasticizing and adhesive components; it does not contain tar. Can be applied to the inside of tanks, outside of buildings, below grade, structural steel and other surfaces not exposed to heavy traffic or organic solvents. Sika Chemical Corp., 35–49 Gregory Ave., Passaic, N. J.

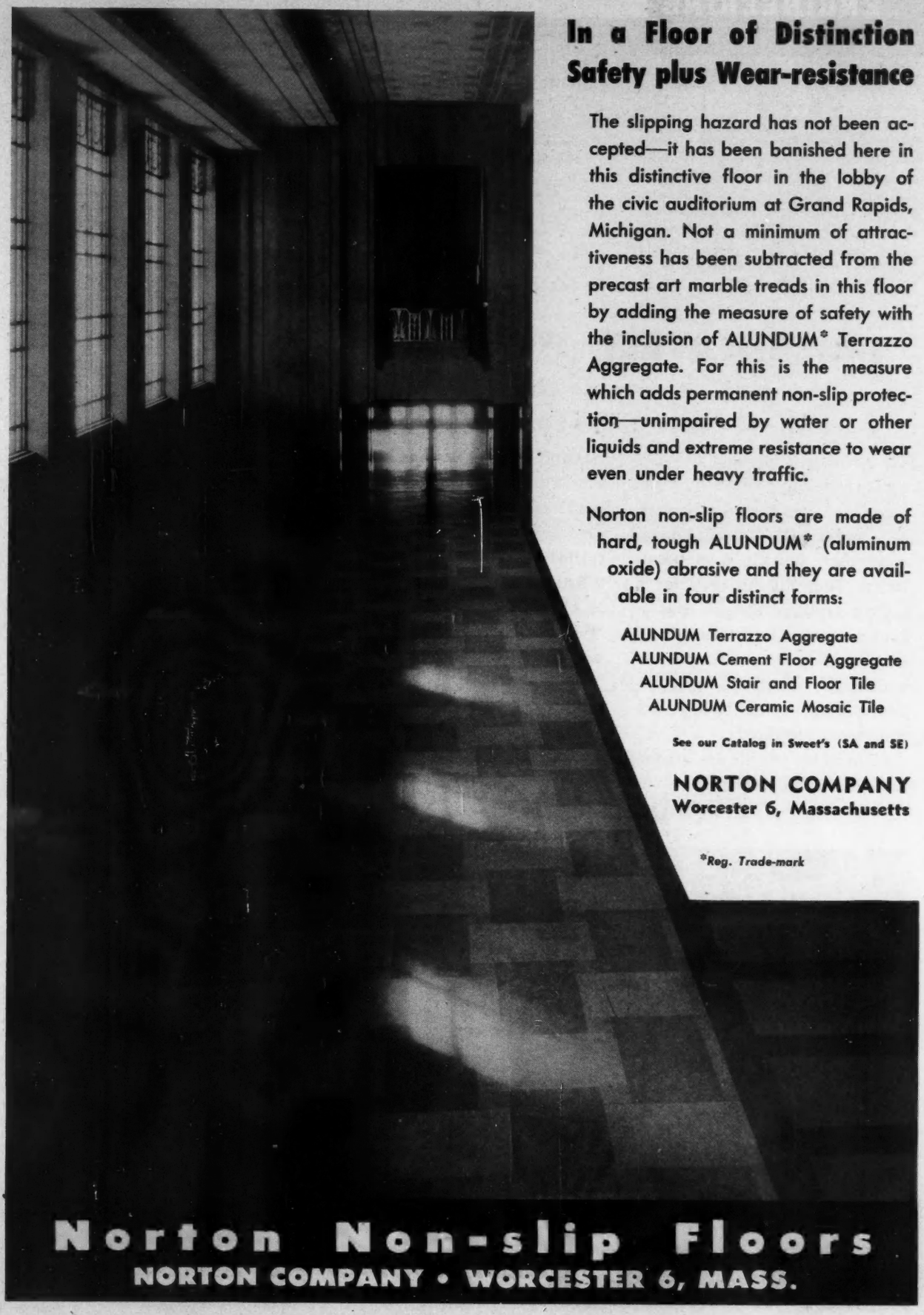
PLASTIC WALL TILE

Eight new colors in Miraplas plastic wall tile are now available and all of them solid and all in the pastel shades. Developed and selected through close cooperation with manufacturers of the raw plastics materials and with leading interior decorators, the new colors are designed to blend perfectly with all other colors which might be used in interior decorating and to be restful to the eyes. S & W Mouldings Co., 990 Parsons Ave., Columbus 6, Ohio.

KITCHEN ACCESSORIES

Recently added to the *Kitchen-Kraft* line of steel kitchen cabinets is a broom and linen cabinet which is completely

(*Continued on page 182*)



In a Floor of Distinction Safety plus Wear-resistance

The slipping hazard has not been accepted—it has been banished here in this distinctive floor in the lobby of the civic auditorium at Grand Rapids, Michigan. Not a minimum of attractiveness has been subtracted from the precast art marble treads in this floor by adding the measure of safety with the inclusion of ALUNDUM* Terrazzo Aggregate. For this is the measure which adds permanent non-slip protection—unimpaired by water or other liquids and extreme resistance to wear even under heavy traffic.

Norton non-slip floors are made of hard, tough ALUNDUM* (aluminum oxide) abrasive and they are available in four distinct forms:

ALUNDUM Terrazzo Aggregate
ALUNDUM Cement Floor Aggregate
ALUNDUM Stair and Floor Tile
ALUNDUM Ceramic Mosaic Tile

See our Catalog in Sweet's (SA and SE)

NORTON COMPANY
Worcester 6, Massachusetts

*Reg. Trade-mark

Norton Non-slip Floors
NORTON COMPANY • WORCESTER 6, MASS.

(*Continued from page 180*)

enclosed on all four sides, bonderized and sprayed inside and out with Du-Pont Dulux enamel, baked on. Doors are insulated and sound-deadened. Hooks are provided for hanging up cleaning equipment; two shelves in the upper compartment are adjustable to any height on 2-inch centers. If desired, shelves may be added to the bottom compartment to convert the unit into a linen or utility cabinet. Midwest Mfg. Co., Galesburg, Ill.

FLUORESCENT LIGHTING LAMPHOLDER

An improvement in design of the *Medium Combination Lampholder* for fluorescent lighting fixtures is said to facilitate assembly of the lampholder to the fixture when used in conjunction with the terminal screw insulating cover. The starter base cover is now designed with a locking ear "tab" which automatically holds the terminal screw cover in place when once inserted. This permits the operator to simply drop the nut in the slot provided in the front of the lampholder and use a 5/8-in. mounting screw to fasten the device to the fixture. It also eliminates the large nut protuberance on the bottom of the combination starter base. Sylvania Electric Products, Inc., Fifth Ave., New York City.

IMMEDIATELY POPULAR

Bradley Postwar-Designed All-Metal Washfountains

The ultimate in modern, sanitary group-washing equipment, these durable enameled iron and stainless steel Bradley Washfountains merit their quickly won popularity. They fill the need for a highly sanitary fixture that is acid-resistant and capable of withstanding the severe abuse to which Washfountains in industrial plants or institutions are sometimes subjected.

Eight to ten people are accommodated simultaneously at the 54" Washfountain thus making possible unusual savings in water consumption, space, maintenance and piping connections; also available in 36" size. Distributed through plumbing wholesalers . . . BRADLEY WASHFOUNTAIN CO., 2227 West Michigan Street, Milwaukee 1, Wisconsin.

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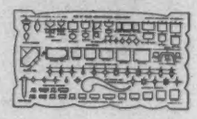
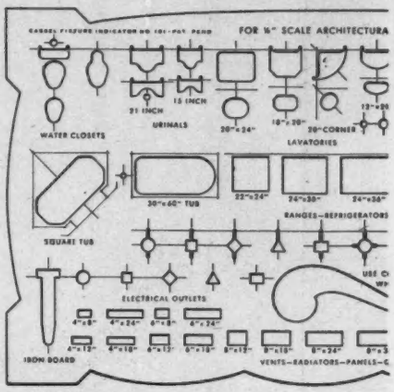
New 24-page illustrated Catalog 4701 is now ready for distribution. Write for your copy today.

BRADLEY *Washfountains*

Fixture indicator designed to save architects' time





FIXTURE INDICATOR

An ingenious time-saver for architects in the indication of building fixtures and symbols is the *Cassel Fixture Indicator No. 101.* Designed by architects and conforming to architectural graphic standards, it is template made of translucent plastic composition cut out to permit accurate drawings in ¼-in. scale. Graphic Indicator Co., 1154 S. Western Ave., Los Angeles 6, Calif.

LAMPHOLDER

A heavy-duty 2–40 watt fluorescent industrial lighting unit features the newly developed *Twin Turret* lampholder with powerful spring tension on both ends to prevent lamps from falling out and to eliminate flicker caused by poor electrical contact. The unit is of all steel construction, mounts singly or end-to-end, flush or suspended on chains, rods or conduit. Four models provide a choice of baked enamel or porcelain enamel reflector, with or without "Instant Start." Mitchell Mfg. Co., 2525 Clybourn Ave., Chicago 14, Ill.

ELECTRIC REFRIGERATORS

A 34½-in.-high electric refrigerator, the *Lo-Boy* is designed for the "streamlined" kitchen, to form a continuous working area with sink, stove, etc. where space is at a premium, it can fit under a standard table top gas or electric range. Has nine freezing speeds and a hermetically sealed freezing unit, 50 or 60

(*Continued on page 184*)

THE MODERN FINISH
FOR WALLS AND CEILINGS
OF ALL TYPES OF BUILDINGS

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HOTEL EASTON — EASTON, PA.

Thomas, Martin & Kirkpatrick Architects

One of the many hundreds of hotels throughout the country where FABRON is extensively used to decorate and protect walls and ceilings.

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COMPLETES THE STRUCTURE - DECORATES THE WALL

FABRON is a **permanent wall finish** that serves a dual function — it completes the structure and decorates the wall — in one simple operation.

As a finish to the structural wall, FABRON reinforces sub-surface materials . . . prevents plaster cracks . . . withstands hard usage . . . prevents the spread of fire . . . and serves generally as a wall-protective agent.

As a decorative medium, FABRON, available in colors and designs to meet every decorative requirement, offers the architect a great latitude of expression in developing his composition.

FABRON's durability, washability and sunfast colors eliminate the expense and inconvenience of periodic wall repairs, replacements and redecorations — factors which appeal strongly to your clients.

Its moderate cost — its low-cost maintenance — its permanency and its fire-safety — which all must be considered in determining its cost-to-use — make FABRON the **most economical finish** for walls and ceilings, especially of hotels, hospitals and institutions, where every effort is made to reduce operating costs, without sacrificing beauty.

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SEE OUR CATALOG IN SWEET'S

(*Continued from page 182*)

cycles, 110v a-c. White, baked-on enamel finish outside, full porcelain interior and automatic lighting. Paley Mfg. Co., 244 Herkimer St., Brooklyn 16, N. Y.

WINDOW SASH

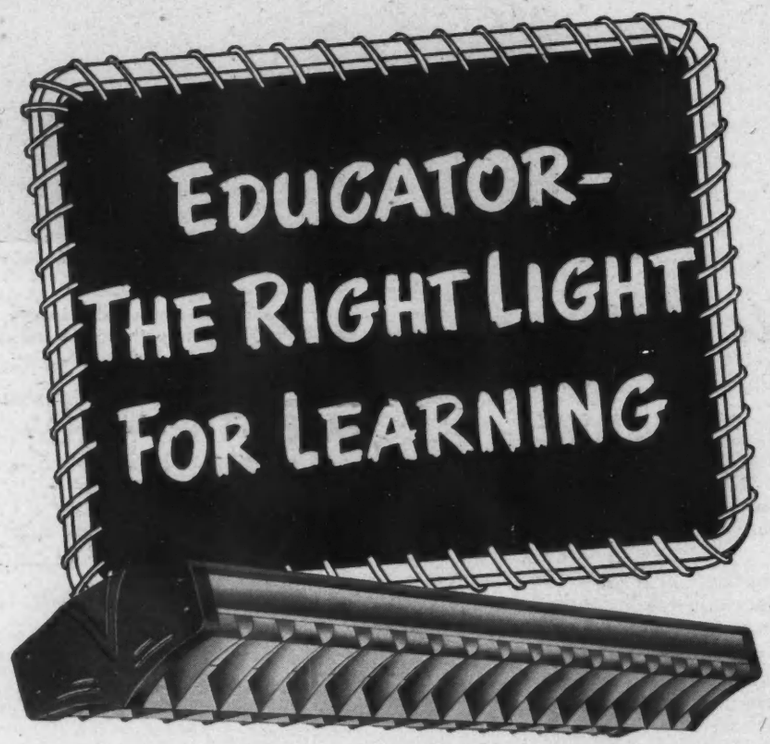
For Picture Windows

An extruded aluminum alloy frame for picture windows, first introduced at the Retail Lumbermen's convention, is shipped unassembled in a knocked-down kit which can be carried under one arm. It is manufactured to accommodate all standard sizes of Thermopane, can be produced also in special sizes. Hunter Products, Inc., Bristol, Pa.

For Thermopane

A double-hung wood sash for Thermopane, said to be adaptable to conventional windows and to eliminate the need for storm sash, was among several new products displayed at the recent Northeastern Retail Lumbermen's Association convention. Especially designed for volume production and speedy installation, the new sash costs about 20 per cent more than storm sash, but is expected to make up the difference quickly by the prevention of breakage and the elimination of paints. Black Millwork and Lumber Co., Inc., Midland Park, N. J.

Aluminum frames for picture windows, will fit all standard sizes of Thermopane



LPI means Low Priced Illumination in the Educator. It's the ideal fixture for schools and other institutions where eager young eyes demand the best in lighting and thrifty budgets require economy.

If the schools in your community are designed for the health and comfort of their students, the LPI Educator is worthy of consideration. In both beauty and utility, it's the Best That's New in School Lighting. An LPI lighting expert near you will be glad to tell you more about this fine new fixture. Sold through leading electrical wholesalers.

LPI

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HIGHLAND PARK, ILLINOIS

SOAP DISPENSER

Lathurshelf is a stainless steel soap dispenser, shaped so that it may also serve as a shelf over the lavatory. Lather is dispensed by a pushbutton; capacity is ½ gal. of liquid soap. American Dispenser Co., Inc., 215 Fourth Ave., New York 3, N. Y.

VENTILATING UNIT

A ventilating unit featuring a bakelite propeller is claimed to operate almost noiselessly, to be non-magnetic, free of vibration and distortion, and to require a minimum of current. The propeller has been designed to increase ventilating efficiency and to permit the use of a lighter, less expensive motor. The unit comes with a standard 110-volt a-c motor, is also available for d-c and in other voltages. Roto-Beam, 1755 N. Keeler Ave., Chicago 39, Ill.

ALUMINUM TILE

A new wall tile, *Muralux Jewel-Tone Tile*, is made of aluminum in a number of pastel shades. The metal is precision die-formed and put through an electrochemical coloring process. Adaptable for home, industrial and commercial use, the tile is said to reflect light as high as 85 per cent without glare. Guild Products, Sandusky, Ohio.

ELECTRIC WALL HEATER

A built-in thermostat with adjustable control is the feature of a new electric wall heater said to maintain desired temperatures for economical performance. Heats by both radiation and con-

(*Continued on page 186*)

1 BLEND RADIANT HEATING...

See those arrows coming from the Modine Convector Panel below the window? That's *radiant heating*—mild radiant heat in just enough quantity to offset heat loss from window area.

2 WITH CONVECTION HEATING

These arrows illustrate *convection heating!* Hot water or steam passes through copper heating unit which draws cooler, floor-line air into bottom of convector where it's warmed, rises and passes out through grille.

RESULT:

Modine Convector Radiation ...the greatest forward step in modern heating science!

Two great heating principles blended into one—that's what Modine Convector Radiation offers you! This modern, combination heating is *the* dependable new hot water and steam heating system for moderate cost homes and apartments . . . as well as commercial and institutional buildings.

Best of all—Modine Convector Radiation now costs less than any other form of radiation. It gives you these *extra* advantages which you can't afford to overlook: 1) individual room control. 2) instant response to automatic controls. 3) gentle air circulation without the use of moving parts that wear out. 4) distinctive room charm and cleanliness without unsightly radiators.

If you're planning to build or modernize, specify Modine Convector Radiation. Call Modine's Representative listed in the "Where-to-Buy-it" section of your phone book. Or send for new, free Convector Booklet! MODINE MANUFACTURING CO., 1510 DEKOVEN AVENUE, RACINE, WISCONSIN.

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CONVECTOR RADIATION

The modern "proved by use" heating method

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Modern Beauty

Adds to Living Space

Priced for Today's Homes and Apartments

Close Temperature Control

Easy to Install

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● Stretch your oil supply by replacing obsolete equipment with Todd Burners. Avail yourself of the years of experience of Todd engineers.

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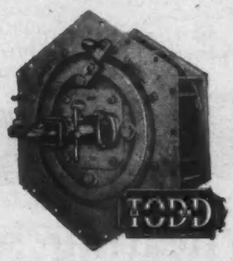

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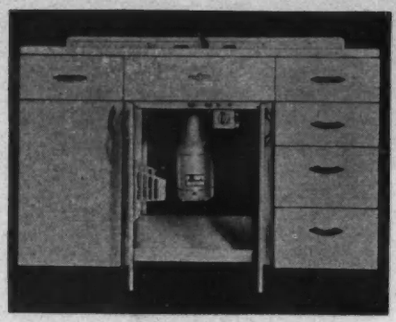
ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 184*)

vection and may be recessed in the wall. Units are available in 1500, 2000, and 4000 watt capacities, operating on 230 volt a-c. Dept. AR, Electric Heating Dept., Westinghouse Electric Corp., Emeryville 8, Calif.



Mechanical kitchen waste disposer "chews" up garbage and is self-cleaning

WASTE DISPOSER

The *Mullinaider*, a new mechanical waste disposer, is a motor driven unit which "chews" kitchen garbage into finely pulverized particles easily flushed down the drain. According to the manufacturers, it will handle any kitchen waste except the largest bones.

Thoroughly field-tested, the Mullinaider is a self-cleaning unit in which the grinding mechanism reverses itself each time the motor is turned on. It can be installed in either single or double bowl sinks. Youngstown Kitchens, Mullins Mfg. Co., Warren, Ohio.

LIGHTWEIGHT ROOF INSULATION

Savings in both weight and money are reported to have been achieved at the new Augusta, Ga., plant of the Lily Tulip Cup Corp. through the use of vermiculite roof insulation.

The 4-acre roof of the new plant consists of Zonolite insulating concrete over an H. H. Robertson steel roof deck. Mixed at the site, the concrete is a combination of Zonolite stabilized concrete aggregate — a specially sized and treated grade of vermiculite — and Portland cement and water. It was placed over alternate panels of the steel deck, poured monolithically over saddles, resulting in a continuous, jointless sheet of insulation. Only one application was considered necessary to provide both insulation and structural strength.

Zonolite concrete weighs only 16 lb. per cu. ft., and is said to be both rotproof and fireproof. Tests by Underwriters' Laboratory on constructions incorporating the material have shown a 4-hour fire rating.

(*Continued on page 188*)

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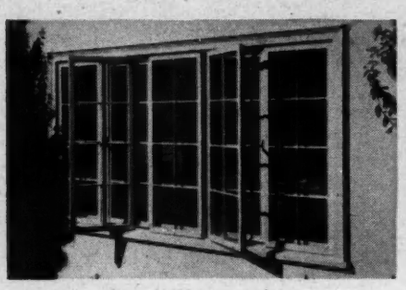
226 TUCKER AVE., SHELBY, OHIO

ALSO MFRS. PAGING AND SPRINKLER ALARM SYSTEMS

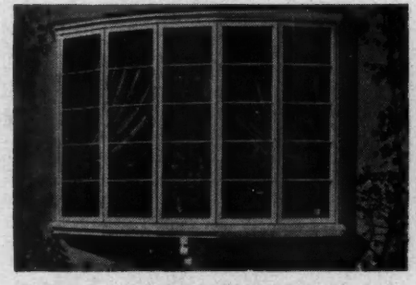
From basement to attic... Curtis SILENTITE means *More Value!*

The new Curtis Silentite double-hung window unit is 20% more weather-tight than the famous original Silentite introduced in 1932. New construction includes floating weather-strips that press snugly against moving parts of window, yet permit easy operation. And, of course, Silentite has no weights or pulleys. Photo shows Silentite double-hung units flanking a Curtis picture window.



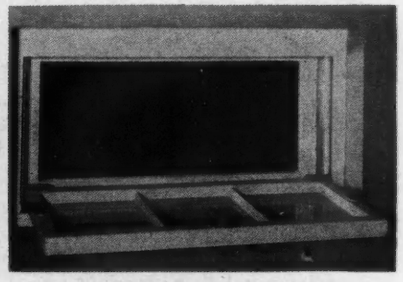
Silentite casements combine better appearance, easier and more dependable operation and greater weather-tightness than ordinary casements. They were developed after years of research and testing. The Silentite casement is a complete unit with all parts machined and prefitted. It is wood, of course, for lasting satisfaction. This is an exterior view of the large illustration above.

The popularity of the picture window is growing rapidly for both new work and remodeling. There are many possible combinations with Silentite windows flanking the stationary sash, or these sash are often used alone, as pictured above. This is Curtis Design C-2735 and is made in two sizes —5-0x4-6 and 6-0x4-6. This sash is shown on far left with double-hung Silentites on either side.



The new Curtis bow window is a complete unit made up of horizontal light casement sash, and may be used in any wall construction. Rough opening size—width 8' 2", height 5' 8½". Two of sash may be arranged to open. Different style casement sash may be used, if desired. The Curtis dealer in your area will give you full information on this and other Curtis Woodwork. See him soon!

This full circle Curtis window may be opened for ventilation to half its area. It is fully weather-stripped. Fits any architectural style. Unit consists of frame, pre-fit, circle window, screen and operating hardware. Sash opens from inside without disturbing screen. Special combined lock and fastener holds sash securely in a closed, half open or fully opened position. Over-all diameter is 2'-0".



Silentite basement unit consists of frame, sash installed with all operating hardware and weather-strips applied, and pre-fit screen. No hardware visible on outside. Window operates from inside only with full control of sash without disturbing screen—opens to any degree up to entire opening area. No rattling or vibration. Made in commonly used sizes for any wall construction.

★ *Silentite WOOD windows are made by the manufacturers of Curtis Woodwork. Curtis has made windows and fine woodwork since 1866. When you specify or recommend "Curtis Silentite," you guarantee your clients and customers honest and lasting window satisfaction.*

1866 CURTIS WOODWORK
SILENTITE
PRE-FIT
the *Insulated* window

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Gentlemen: Please send me booklet on Curtis Silentite Windows.

Name.....

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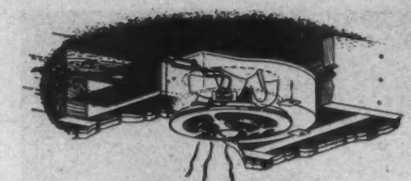
(Please check above)



FRYING FISH IS AN ARCHITECT'S PROBLEM

The problem of removing unpleasant cooking odors and grease definitely is in the architect's lap today. Women *expect* it to be solved *in the plans.*

THE BEST SOLUTION IS

Blo-Fan

ELECTRIC CEILING VENTILATOR

Blo-Fan installs in the *ceiling*, directly over the range, where a fan belongs. It collects foul air before it can spread.

Blo-Fan's patented combination of fan and blower principles provides an efficiency unobtainable in any other fan. See Sweet's 29b/12, or write for complete information.

Blo-Fan

more than a fan...more than a blower

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ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 186*)

METAL DOOR CANOPY

A packaged door canopy, the *Lumi-Shade*, particularly suited to the low cost home, is constructed of interlocking aluminum sections. Ventilated at the edges, it is designed to drain snow and water to the gutter and off the side at the corners, and to prevent catching leaves and dirt. Finished in colorfast baked enamel that will not chip, crack or fade. Can be cleaned with a damp cloth. Thabet Mfg. Co., 626–628 Huron St., Toledo 4, Ohio.

STANDARDS

Commercial Standard for Automotive Lifts (*CS 142–47*). Voluntary standard developed by the trade, covering hydraulic and mechanical lifts, including frameless suspension lifts for outdoor and indoor installations in rated capacities through 75,000 lb. Includes definitions, requirements for electrical equipment, control mechanisms, requirements for welding and allowable design stresses with definite stress computation formulas. Superintendent of Documents, Government Printing Office, Washington 25, D. C.

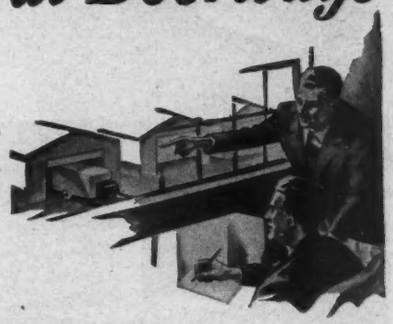
Commercial Standard for Testing and Rating Convectors (*CS 140–47*). Covers methods of testing and rating cast-iron and nonferrous steam and hot water convectors used for heating rooms, and procedure in obtaining approval of ratings to be published and a uniform method of manifesting compliance with the standard. Makes available a method of rating convectors which takes into consideration the condensation of water heat capacity and a heating effect evaluation found to be generally acceptable. Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Hardwood Dimension Lumber (*Commercial Standard CS 60–48*). Revised standard setting forth minimum specifications for solid and glued-up hardwood dimension lumber in five grades of flat stock and four grades of squares. Covers a definition of the product, permissible defects, measurement and tolerances for rough, surfaced, semifabricated and completely fabricated hardwood dimension lumber. Commodity Standards Division, National Bureau of Standards, Washington 25, D. C.

CORRECTION

The 16-in. wall paneling consisting of birch weldwood plywood which was described in this department in the January issue (p. 148) was incorrectly referred to as Weldwood. The correct name of the product is *Plankweld.*

STOP Efficiency Loss *at Doorways*

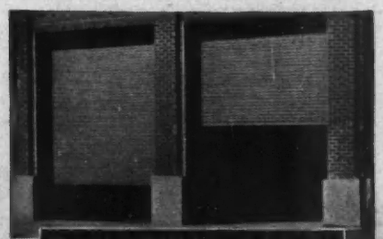


● Plant efficiency often bogs down at doorways without letting you know it. Costs pile up while vehicles wait for doors to be opened. Time and labor is lost when busy employees open or close doors. Heating and air-conditioning costs soar when doors aren't closed promptly.

You can put a quick stop to these profit leaks by installing Kinnear Motor Operated Rolling Doors.* With a touch of a button, you raise or lower these doors at a second's notice—from any number of convenient points. They open straight upward and coil compactly above the lintel; all floor and wall space is *fully usable* at all times. The opened doors stay overhead, safe from damage by wind or vehicles. Their rugged, all-steel construction assures longer wear, lower maintenance, extra protection against fire, theft, and storm damage.

Keep door efficiency in step with the rest of your plant; call your Kinnear representative, or write us today, for full information on Kinnear Rolling Doors.

**Manually operated Kinnear Rolling Doors also available.*



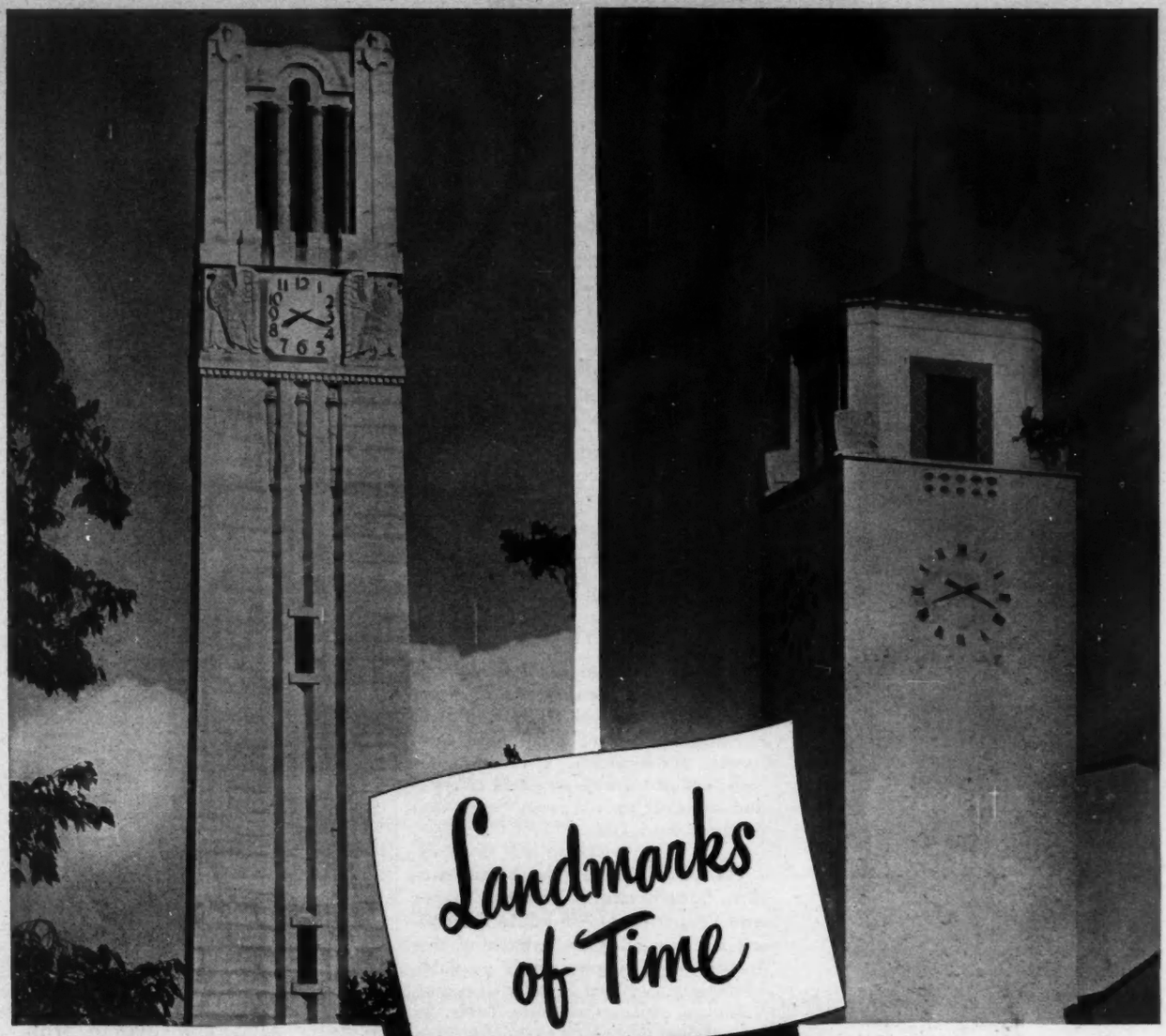
KINNEAR ROLLING DOORS

The KINNEAR MANUFACTURING CO.

1860-80 Fields Ave., Columbus 16, Ohio

1742 Yosemite Ave., San Francisco 24, Calif.

Offices and Agents in Principal Cities



War Memorial, North Carolina State College of Agriculture and Engineering

Los Angeles Union Passenger Terminal

To the architect, IBM offers this service:

Planning—IBM time experts are available to help with specifications and to provide wiring diagrams and technical information, either for new tower clocks or for electrifying and modernizing existing ones.

Installation—An IBM Master Control, installed by technicians backed by many years of IBM's experience, keeps all faces of the tower clock on accurate, uniform time. This same Control can be used to regulate any number of time indicating, recording, and signaling units throughout the building.

Maintenance—Maximum coverage and prompt, efficient service to installations is given by the many IBM branch offices located in principal cities and towns throughout the United States.

IBM representatives will be glad to give you further information on this service. Write or call the IBM office nearest you.

IBM

TIME RECORDERS AND ELECTRIC TIME SYSTEMS

Proof Machines • Electric Punched Card Accounting Machines and Service Bureau Facilities • Electric Typewriters

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tread stock by ALBERENE

FOR SAFETY

Alberene stone's highly-toothed surface is always safe — wet or dry.

FOR WALKING COMFORT

Slip-proof, but never excessively so. Alberene stone treads retard your feet, but never bring them to a dead stop.

FOR DURABILITY

Dollar for dollar, Alberene gives you higher abrasion resistance than other stone. It's pit-proof, too.

FOR BEAUTY

Alberene stone's fine, *finished* appearance . . . its neutral blue-gray color . . . harmonizes with any wall treatment.

For full data about the many advantages of Alberene tread stock, write —

ALBERENE STONE CORP. OF VIRGINIA
419 — 4th Ave., New York 16, N. Y.

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 150*)

cross-sections, views, specifications for architects, dimensions, diagrams. 12 pp., illus. Wooster Products, Inc., Wooster, Ohio.*

SCREW THREAD INSERTS

Heli-Coil Screw Thread Inserts (Bulletin No. 148). A bulletin describing the uses of Heli-Coil inserts in industrial applications as original equipment as well as for repair of stripped, damaged or incorrectly tapped threads. 4 pp., illus. Heli-Coil Corp., 47–23 35th St., L. I. City 1, N. Y.

SODA FOUNTAINS

Seco-Superex (Catalog SS-1). Catalog of Superex soda fountain units formerly designed only for Rexall Drug Co., which are now offered to other fountain and good operators. Seco Co., Inc., 5206 S. 38th St., St. Louis 16, Mo.

STEEL PRODUCTS

Truscon Formed Steel Surrounds for Residential Casements (Bulletin A-264). Description of Truscon Steel Surrounds for residential steel casements. Specifications, installation details, detailed drawings, chart of types and sizes. 8 pp. Truscon Steel Co., Youngstown 1, Ohio.*

Handbook of Steel Joist Construction, Specifications, Loading Tables and Properties (1946 Edition). Pending issuance of a new edition of this Handbook, a supplement is available containing a revised Standard Loading Table and explanatory notes. Table has been revised to conform to simplification measure effective June 1, 1948; six types of nailer joists will be discontinued. Copies of the 1946 Handbook still available, with supplement. 16 pp., illus. Steel Joist Institute, 1200 Eighteenth St., N. W., Washington, D. C.

Stainless Steel Dimensional Data (Bulletin 476). Describes alloy fittings and flanges; welding fittings from ¾ in. to 12 in., and light-weight American Standard flanges from ¾ in. to 30 in., all available in stainless types 304, 316 and 347, monel, inconel, nickel, copper and other industrial metals. Pocket-size folder. Taylor Forge & Pipe Works, P. O. Box 485, Chicago 90, Ill.

TIMING DEVICES

Haydon Timing Motors and Devices. Shows synchronous timing motors, timing devices and clock movements with separate sections or data sheets for each of the 9 motor series manufactured, and for the various types of timing de-

(*Continued on page 192*)

Got Tired "Patching Up" School Heating System

In 1945 the Board of Education in Salem, N. J., decided to do something about the "patched up" heating system in their high school.

There were four steps in the heating modernization program.

August, 1945 . . . Property Committee asked Warren Webster & Co. to suggest heating system improvements for inclusion in 1946 budget.

January, 1946 . . . Webster Representative submitted suggestions for modernization program.

Salem High School, Salem, N. J. Built 1912. Wings added 1927. Steam heat distribution modernized 1946 with Webster "Controlled-by-the-Weather" Moderator System. Modernization Heating Contractor — William J. Kelly, Inc., Camden, N. J.

June, 1946 . . . Property Committee approved Webster Heating Modernization Program. Board of Education voted unanimously to follow Committee's recommendations.

October, 1946 . . . Installation of Webster Moderator System with "Controlled-by-the-Weather" Outdoor Thermostat completed by Contractor William J. Kelly in time for start of heating season. Stoker-fired coal-burning boiler retained.

Now all sections of the school heat evenly and rapidly. Heat loss from open windows is minimized. Heating-up time is shortened.

There is a trained Webster Representative not far from your city. He is available to cooperate with you, your engineer and contractor in serving *your* school clients.

WARREN WEBSTER & CO., Camden, N. J.
Representatives in principal U. S. Cities : : Est. 1888
In Canada, Darling Brothers, Limited, Montreal

WEBSTER
MODERATOR
SYSTEM
OF STEAM HEATING
"Controlled by the weather"

FOR HOSPITALS OF DISTINCTION:

Counter-type storage cabinet in unsterile workroom of Central Service Department. Adjustable stainless steel shelves, metal doors. Stainless steel counter top, back and end splashers.

Recessed supply cabinet in septic operating room

SCANLAN-MORRIS
Recessed Cabinets

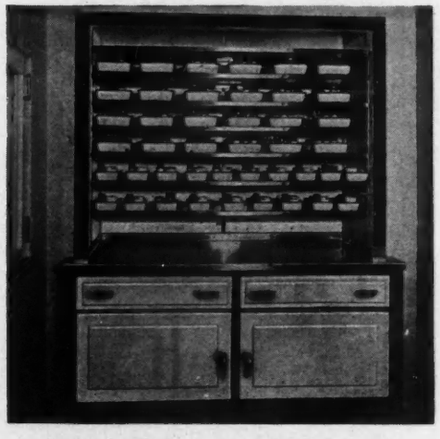
Authentic Guidance and Assistance Available to Architects, Without Obligation

• Storage of supplies and materials in the modern hospital is greatly facilitated by the installation of Scanlan-Morris Recessed Cabinets — engineered to fit requirements.

Many years of direct contact with hospital superintendents, surgeons and architects, qualify the Scanlan-Morris Technical Sales Service Department to supply valuable assistance and authentic guidance in such installations—backed by more than 40 years of experience in designing and manufacturing hospital and surgical equipment (not only cabinets but also surgical lights, complete sterilizing equipment and other hospital equipment).

Scanlan-Morris Recessed Cabinets are made in styles and sizes as required to serve the needs of the various hospital departments. Cabinet bodies are made of heavy-gauge steel, with double-lapped and sweated seams, insuring sturdy, dust-proof construction; frames are electrically-welded flat steel; doors and shelves may be of glass or metal, counters and shelves of stainless steel or other metal, as specified.

Mail the coupon for detailed information or submit your problems with floor plans for layout suggestions, without obligation.



Recessed cabinet in maternity department. Upper section open and fitted with adjustable stainless steel shelves for holding mothers' treatment trays.

Ohio Chemical

MANUFACTURERS OF MEDICAL APPARATUS, GASES AND SUPPLIES FOR THE PROFESSION, HOSPITALS AND RESEARCH LABORATORIES

OHIO

THE OHIO CHEMICAL & MFG. CO.
1400 East Washington Ave., Madison 3, Wisconsin

Represented in Canada by Oxygen Company of Canada, Limited, and Internationally by Airco Export Corporation, 33 West 42nd Street, New York

BRANCH OFFICES IN PRINCIPAL CITIES

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Send information on ☐ Scanlan-Morris Recessed Cabinets
(Please attach professional card or letterhead)

Name .....

Address .....

City ..... State .....AR

ONLY PIERCE FUSES

have the RUGGED TUBULAR BRIDGE

- TO MAINTAIN BLADE ALIGNMENT
- TO INCREASE FUSE LIFE

Additional exclusive features that mean better protection and lower ultimate cost are:

1. Balanced Lag Link
2. Screened Ventilation

FREE: Balanced Lag Link to inspect and test. Specify amperage, voltage.

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 190*)

vices. Dimensional drawings, tables. 16 pp., illus. Haydon Mfg. Co., Inc., E. Elm St., Torrington, Conn.

UNIT HEATERS

Electromode Unit Heaters (Catalog EC-4). Describes the complete line of Electromode Unit Heaters in detail, from 1500 watts to 60,000 watts. Contains installations, controls and wiring diagrams; a heating analysis sheet to assist in solving industrial heating problems. Describes portable and built-in wall heaters. 16 pp., illus. Electromode Corp., 45 Crouch St., Rochester 3, N. Y.*

VALVES

Rockwood Ball Type Valves. Bulletin showing features of this valve, suggested applications. Dimensional drawings, selection table. 4 pp., illus. Rockwood Sprinkler Co., Worcester 5, Mass.

WATER HEATERS

The Modern Automatic Electric Water Heater. Bulletin describing advantages of electric water heaters, showing diagrams of electric and non-electric installations, production graph and table showing consumer savings on such electric installations. 8 pp., illus. National Electrical Manufacturers Assn., 155 E. 44 St., New York 17, N. Y.

LITERATURE REQUESTED

The following individuals and firms request manufacturers' literature:

Theodore R. Earne, Architect, 40–20 Main St., Flushing, N. Y.

Engineering Officer, Engineer Section, Hqs. XXIV Corps, APO 235, c/o Postmaster, San Francisco, Calif.

Krol-Hastrup-Kreda, Engineers, 542 S. Dearborn St., Chicago 5, Ill.

Office of the University Architect, Engineering Bldg., The University of Wyoming, Laramie, Wyo.

Boyd E. Phelps, Inc., Architects and Engineers, 232 Franklin St., Michigan City, Ind.

Abram Preiskel, Architect, 127 River Dr., Passaic, N. J.

Ernest A. Sterling, Architect, 14 Eastman Bldg., Falmouth, Mass.

Robert L. Strelitz, Architect, 1475 Irving St., N. W., Washington 10, D. C.

Superintendent of Storehouses, Panama Canal, Balboa, Canal Zone (Packages to be marked File 410).

AT LAST . . . Costly Vapor Condensation is *Licked*

Bird Neponset Black Vapor Barrier is the permanent answer to expensive "in-wall" condensation. Applied on the warm side of insulation, it repels vapor, ends stained walls and peeling paint . . . and it keeps insulation at top efficiency.

A small investment for long-lasting protection, Bird Neponset Black Vapor Barrier costs only about $20.00 to give a $10,000 building dry walls that *stay dry*. Consult Sweets Architectural File, 9b-2. For sample, write Bird & Son, inc., 11 Pine Street, East Walpole, Mass.

Specifications — Roll width: 36"; square feet: 500; approximate weight: 50 lbs. Asphalt saturated. Coated both sides with glossy asphalt surface. Meets Federal Specifications UU-P-536 Grade B.

BIRD NEPONSET BLACK VAPOR BARRIER

BIRD & SON, inc., East Walpole, Mass.

Chicago · New York · Shreveport

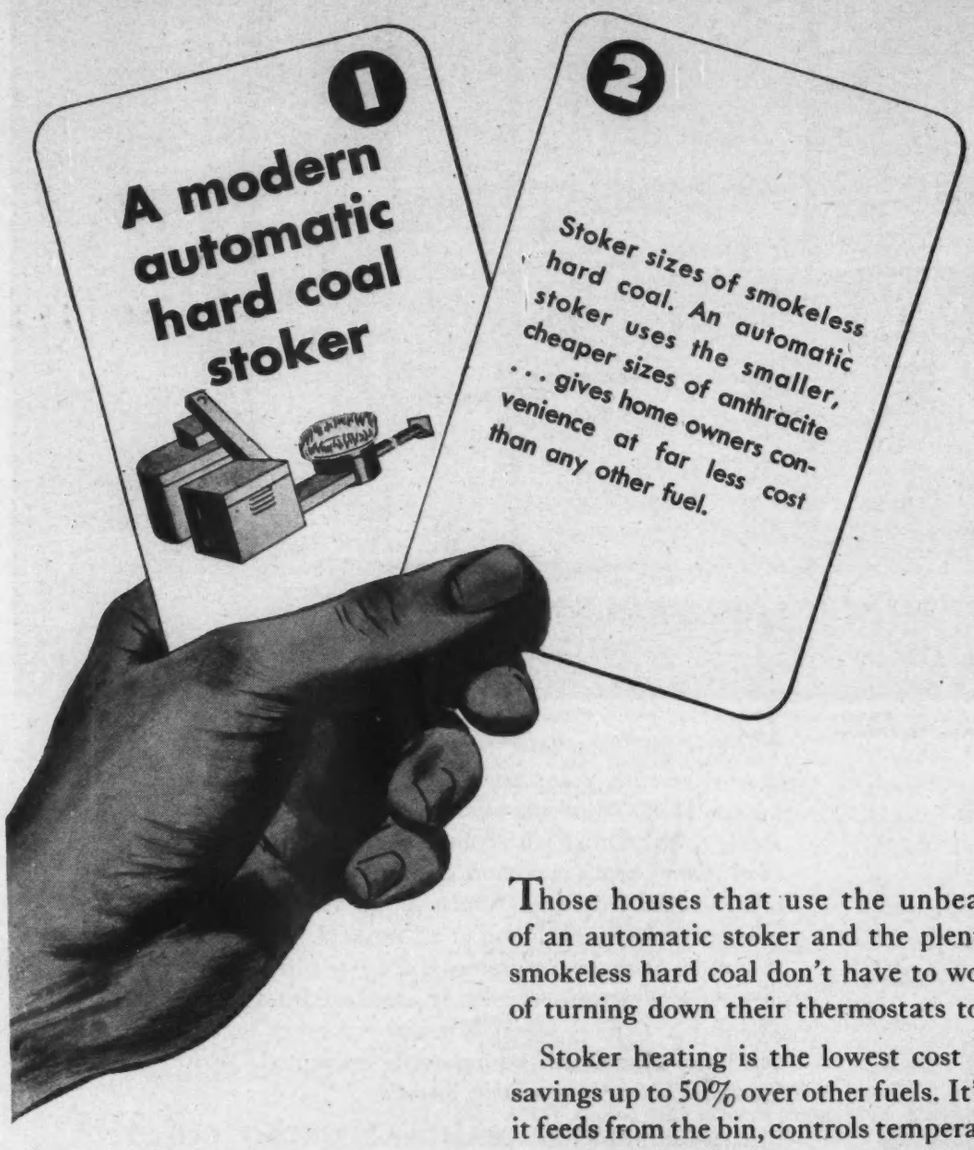
Residence in Miami, Florida. Architect, Robert Fitch Smith. Owner and General Contractor, Jack Mintzer.

Here is the "new look" in modern home building. In this recently completed home in Miami, Florida, Lupton Metal Windows offer greatly increased window area . . . harmonize with contemporary design. Slender steel frames admit maximum daylight and provide permanent weathertightness. Outswinging ventilators provide controlled ventilation at all times. Lupton Metal Windows meet the requirements of every climate. Neat metal frame screens are easily attached from inside. There is a Lupton Metal Window for every type of building — industrial, commercial, residential. Write for our Catalog or see it in Sweet's.

MICHAEL FLYNN MANUFACTURING CO.
700 East Godfrey Avenue, Philadelphia 24, Penna.
Member of the Metal Window Institute

LUPTON
METAL WINDOWS

Here's an unbeatable combination—


1
A modern automatic hard coal stoker
2
Stoker sizes of smokeless hard coal. An automatic stoker uses the smaller, cheaper sizes of anthracite . . . gives home owners convenience at far less cost than any other fuel.

Those houses that use the unbeatable combination of an automatic stoker and the plentiful cheaper sizes of smokeless hard coal don't have to worry about the threat of turning down their thermostats to chilly levels.

Stoker heating is the lowest cost automatic heat with savings up to 50% over other fuels. It's convenient because it feeds from the bin, controls temperature and ash removal automatically. Then too, a full winter's supply of hard coal can be stored in the summer which eliminates the necessity of depending on weather hindered winter deliveries.

Anthracite Institute
Dept. 3-B
101 Park Avenue
New York 17, New York

Please send me more information on anthracite and anthracite heating.

Name_____

Company_____

Address_____

City _____ Zone____ State____

ANTHRACITE INSTITUTE

101 Park Avenue • New York 17, New York

Why the Barrett* SPECIFICATION* Roof

is the toughest, longest-lasting, best-value built-up roof that can be made

1. **BARRETT SPECIFICATION* PITCH AND FELT**
2. *Barrett Application Methods*
3. *The Gravel or Slag Armored Surface*
4. *The Barrett Approved Roofer*

The superiority of the Barrett Specification* Roof is due to the combination of highest-quality roofing materials, the protective surface of gravel or slag, and scientifically standardized application techniques used by Barrett Approved Roofers. The result is a roof so good that it can be bonded against repair and maintenance expense for periods up to 20 years—a roof so good that it regularly outlasts the bonded period by many years.

Barrett* Specification* Roofs

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.
30th St. & Gray's Ferry Ave.
Philadelphia 46, Pa.
2800 So. Sacramento Avenue, Chicago 23, Ill. — Birmingham, Alabama
In Canada: The Barrett Company, Ltd.
5551 St. Hubert St., Montreal, P. Q.

*Reg. U. S. Pat. Off.

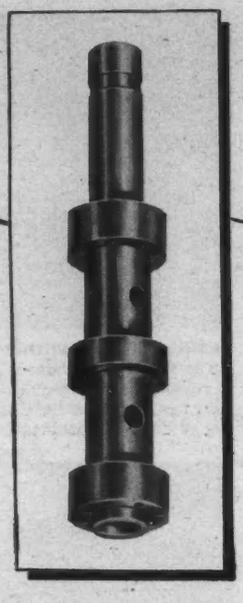
BARRETT SPECIFICATION* Pitch is the *only* pitch that measures up to the high standards of the Barrett Specification* Roof. It is refined from top-quality coal-tar, and recommended application temperatures have been carefully developed. Used according to Barrett specifications . . .

IT PROVIDES the life-prolonging oils that are virtually immune to climatic variations. Barrett Specification* Pitch is actually *preserved* by water, and possesses creosote properties that retard fermentation and the development of fungi.

COMPANION TO Barrett Specification* Pitch is Barrett Specification* Felt—the *only* felt good enough for a Barrett Specification* Roof. It is made from carefully selected and fabricated stock and special coal-tar saturant to meet rigid manufacturing standards.

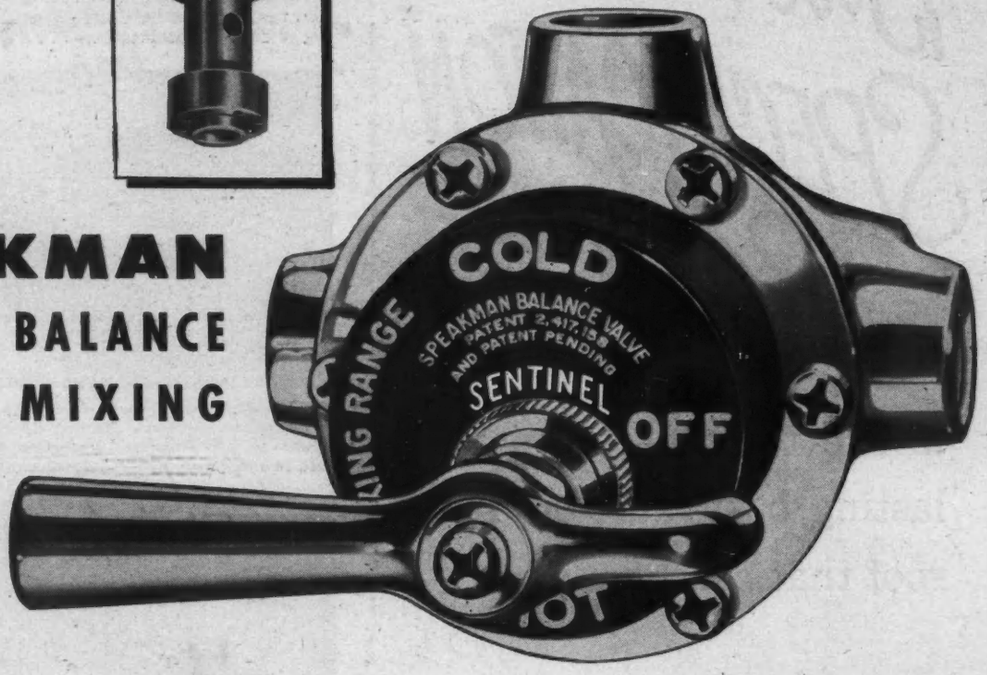
THE UNIFORM texture and thickness of Barrett Specification* Felt are appreciated by experienced architects and contractors. Accurately spaced longitudinal guide lines marked on the felt are an aid to quick and accurate application.

A triumph of engineering



THE F-L-O-A-T-I-N-G SENTINEL
that holds shower temperature steady!

SPEAKMAN
SENTINEL BALANCE SHOWER MIXING VALVE



For a long time everyone has wanted a shower that didn't change to scalding hot or freezing cold every time someone turned on the water "down the line."

Now Speakman brings it to you . . . with the *Sentinel Balance Mixing Valve* that positively maintains the water temperature set by the bather.

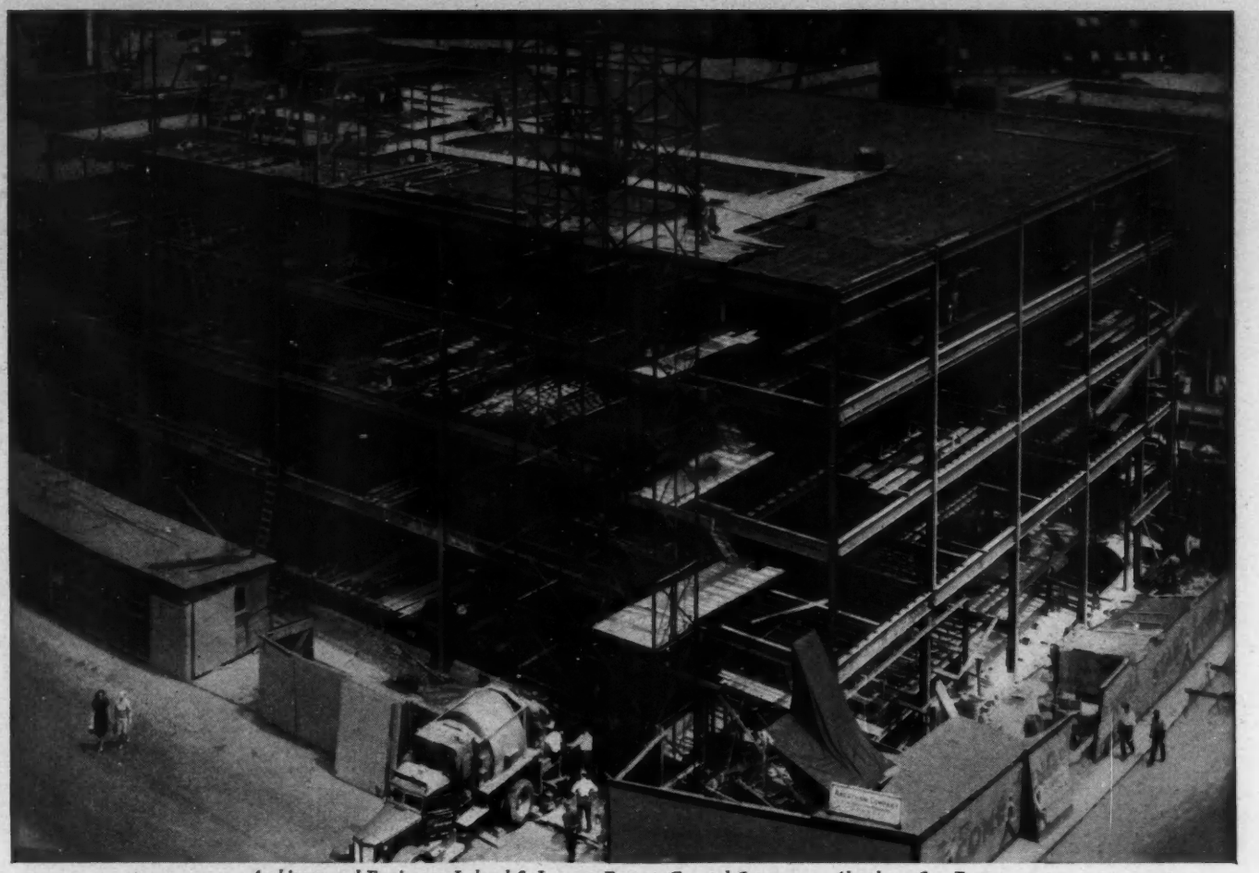
The patented valve with the removable f-l-o-a-t-i-n-g piston, readily accessible, automatically maintains original temperature by compensating for "down the line" water stealing. And the bather never knows anything is happening! In case of a severe drain upon the supply of either hot or cold water, the f-l-o-a-t-i-n-g *Sentinel* immediately cuts down the high pressure side flow port and opens up the low pressure port—thus maintaining the original temperature as set by bather. Thus, sudden chilling or scalding is impossible. When pressure returns, the *Sentinel* automatically restores the flow to the head . . . at the same temperature as before!

The f-l-o-a-t-i-n-g *Sentinel* has no thermostats, rockers, springs, or other gadgets likely to get out of order. It works on water pressure alone! If excessive alkali ever coats the f-l-o-a-t-i-n-g *Sentinel*, it can be cleaned readily by merely shutting off the *Sentinel* valve. . . . it is not necessary to shut off the Hot and Cold supply to the *Sentinel* Shower Valve. This is a great help where shut-off valves may be located at some distant point and perhaps control the whole bathroom.

We'd be pleased to send you complete detailed information on this new safety *Sentinel Balance Mixing Valve*. Write to Department BV.

"Established in 1869"

SPEAKMAN
SHOWERS AND FIXTURES
SPEAKMAN COMPANY, WILMINGTON 99, DELAWARE



Architects and Engineers: Leland & Larson, Boston; General Contractor: Aberthaw Co., Boston

NEW DEPARTMENT STORE IN MAINE USES OPEN-WEB JOISTS

This new addition to the shopping center at Bangor, Maine, is to be used by the W. T. Grant Co. The five-story structure fronts on two streets, and contains more than 85,000 sq ft of floor space. Close to 200 tons of Bethlehem Open-Web Steel Joists were used in its construction.

Any light-occupancy structure, whether a department store, apartment, office building, hospital or school, lends itself readily to the use of Bethlehem Open-Web Joists. For when combined with concrete floor slab and plaster ceiling, these sturdy steel joists provide a relatively low-cost floor construction which keeps fire in check for a minimum of two hours.

Nor is that all. Bethlehem Open-Web Joists eliminate shrinking and sagging floors. They prevent open baseboards. They are immune to attack by termites. They tend to reduce the passage of sound from one floor to another. Bethlehem Open-Web Joists also help speed construction, for they permit pipes and conduits to be run through the open webs. Coming completely fabricated, ready for use without falsework, they can be placed by two men. And merely the services of a light gin pole are required to install the Longspan type of joist.

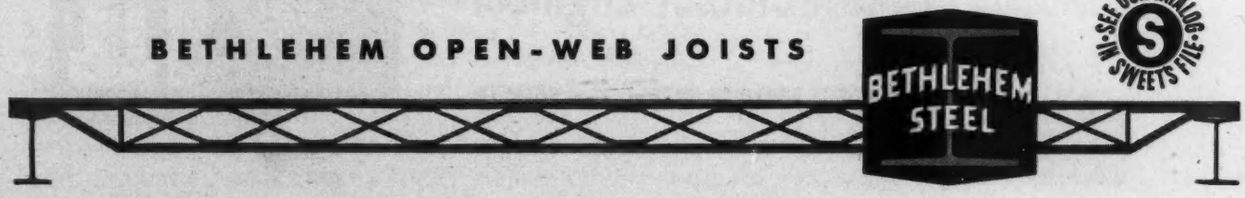
We've a 36-page illustrated joist catalog which you'll find helpful in designing with open-web joists. For your copy, get in touch with the nearest Bethlehem district office, or write direct to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

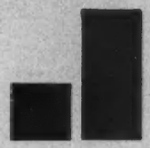
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM OPEN-WEB JOISTS

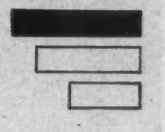


What does it mean when an architectural magazine

More than doubles its annual advertising volume in five years



Leads the second publication by 20%, the third by 55%



Carries 40% of the *total* advertising placed in national architectural magazines *

To Architectural Record's readers it means that in the pages of the Record they see the greatest array of materials and equipment for architect-designed buildings to be found in any magazine — a market-place brought to the specification writer's desk.

To building product manufacturers and their advertising agencies the Record's steady growth has a marketing significance, for it mirrors the growth of the building market. And it underscores the key place of the architect and engineer in the building market.

To the men and women who select advertising media the Record's established leadership — the fact that it carries more advertising from more manufacturers of building products than any other publication in its field — means . . .

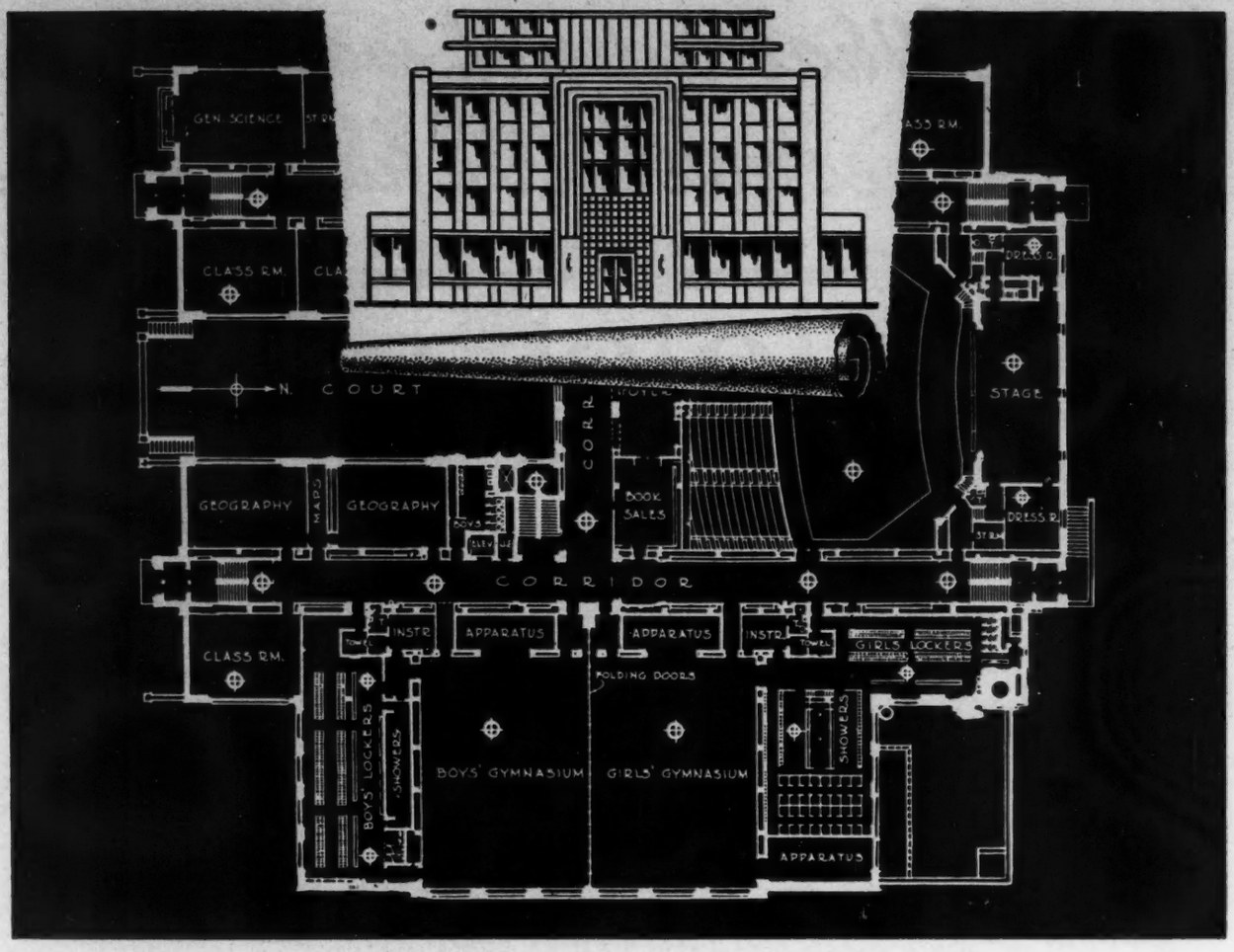
* Only the RECORD showed an advertising gain in 1947.

You are right with the RECORD!

F.W. DODGE CORPORATION

"Workbook of the Architect-Engineer"

119 WEST FORTIETH STREET, NEW YORK 18



Safeguard the schools you design against lighting failure

Today's schools are being used nearly as often at night as during the day. Classes for adult education and for young people who work . . . entertainments in auditoriums and gymnasiums . . . public gatherings for many purposes . . . all are well attended. And wherever crowds gather indoors at night, the dangers that attend lighting failure should be guarded against.

Such lighting failures do happen. Despite all precautions of utility companies, accidents beyond their control can cause interruptions of normal electric current. Storms, floods, fires and collisions may occur with little or no warning, and are a serious handicap to electric power lines.

You can eliminate the chances of lighting failure in the schools, hospitals, theatres, stores and other buildings you design. Exide Emergency Lighting provides safe, sure, modern protection. Batteries are always fully charged and respond *instantly* and *automatically* when needed.

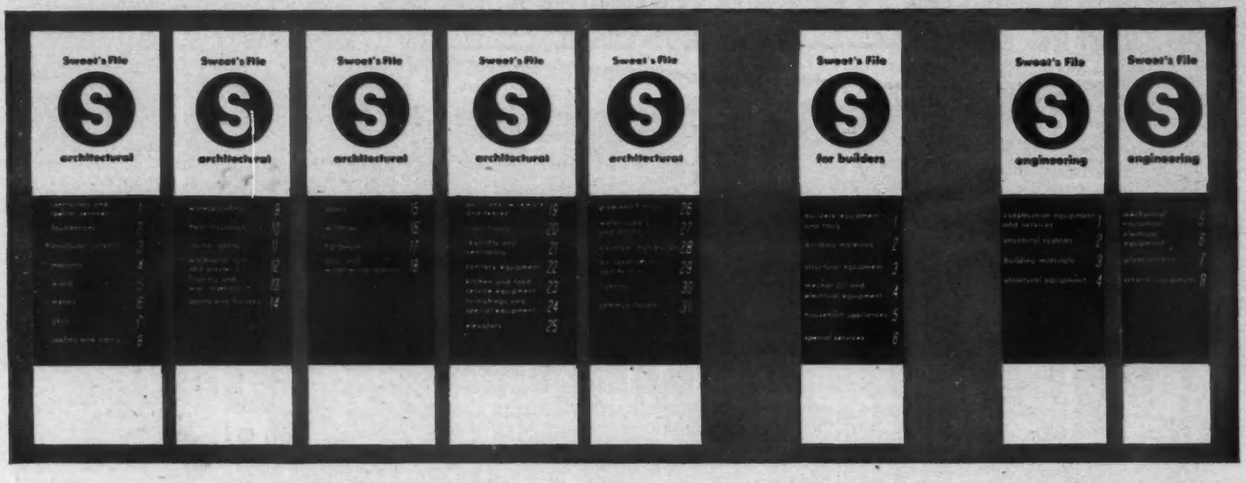
IN EVERY SCHOOL THESE POINTS NEED PROTECTION

- Assembly halls
- Auditorium
- Gymnasium
- Class rooms
- Lockers
- Corridors
- Stairways
- Exits

Exide
EMERGENCY BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • Exide Batteries of Canada, Limited, Toronto

What type of work does your firm handle?



SWEET'S FILE, ARCHITECTURAL SWEET'S FILE for BUILDERS SWEET'S FILE, ENGINEERING

You need information on certain kinds of building materials and equipment, according to the type of work handled by your firm. Other firms, active in other types of projects, need information on products, some of which are of little or no interest to you.

To give each firm of architects, engineers, contractors or builders the product information it requires, and to do so without wasting the money of the manufacturers who pay for this catalog service, Sweet's issues three separate files of catalogs. These three catalog files — *Architectural*, *Builders* and *Engineering* — are distributed in accordance with the type of work done, and the volume of such work.

Thus, a firm of architects designing commercial, educational, institutional, public, religious, recreational or residential buildings (other than small houses) receives Sweet's File, Architectural. Another architectural firm, active almost exclusively in the small house field, receives Sweet's File for Builders, which is compiled especially for designers and builders of light structures.

Architects predominantly active in designing industrial type buildings receive Sweet's File, Engineering. Firms of engineers, contractors or builders are similarly qualified in directing the distribution of the files.

We ask all recipients of Sweet's Files to consider that this service can be effectively rendered only with the cooperation of hundreds of manufacturers. Although some of them have products for all types of buildings, many have more restricted markets. For these, the economies of employing Sweet's service would be lost in excessive distribution of their catalogs. Specialized catalog distribution in three major divisions of the building market serves the interests of all concerned—building designers and constructors on one hand, and manufacturers of building materials and equipment on the other.

Sweet's is working constantly to get more catalogs and better catalogs in each of the files. One of the first things manufacturers want to be sure of is that their catalogs in Sweet's will be placed, without waste, in the right hands.

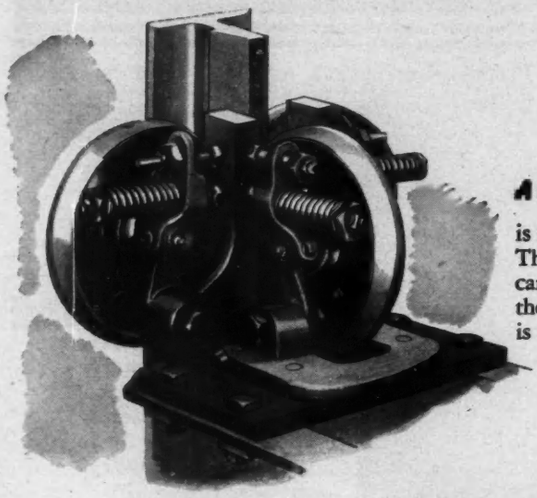
Sweet's Catalog Service
division of F. W. Dodge Corporation
119 West Fortieth Street, New York 18, New York

skylines ... by Otis

In Boston, 3,839 Otis elevators have helped create an ever-growing skyline. Good example is the new 26-story addition to the home office of the John Hancock Mutual Life Insurance Co., which will have the fastest vertical transport in all New England.

TIPS ON TIPPING.

When the fair sex enter an elevator should we men tip our hats? If you've puzzled that one too, here's your answer: in clubs, hotels, apartments, *yes;* in stores and offices, *no.* Our authority? Emily Post.



AIR BORNE

is the way you feel in elevators that ride on Otis Roller Guides. The individual knee action of each rubber-tired roller permits the car to literally float on the rails. It's a simple matter to install these guides on existing elevators — and no elevator is modern without them.

LOCAL COLOR.

Even blindfolded, it's easy to find one of the 256 local Otis offices. For we're represented in all but seven U. S. cities (or their suburbs) of more than 50,000 persons — and in 88 cities of less than 50,000.* Which means that where there are elevators, there are Otis offices, at your service and close by.

*Based on latest U. S. census figures.

ELEVATOR COMPANY

Offices in All Principal Cities

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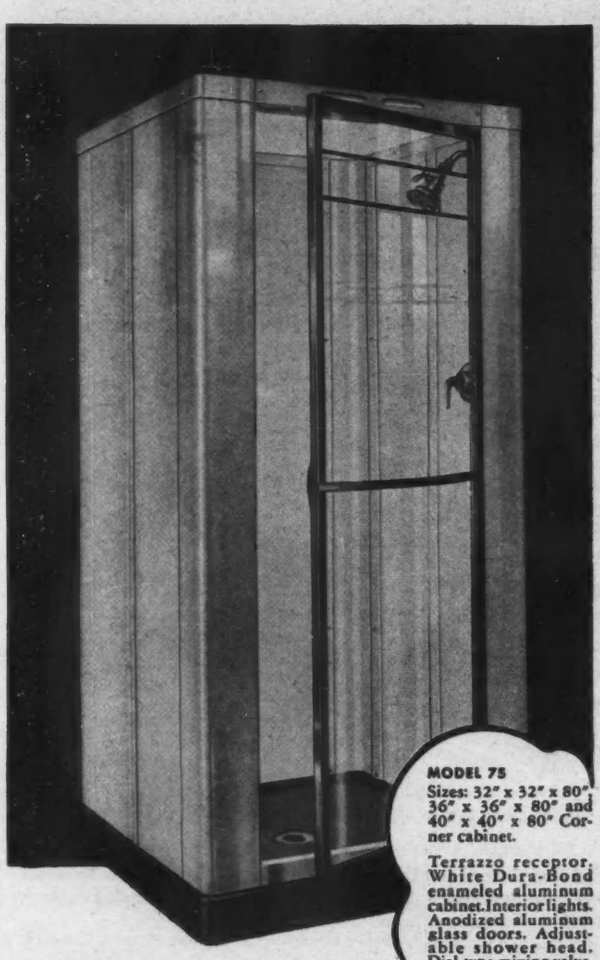

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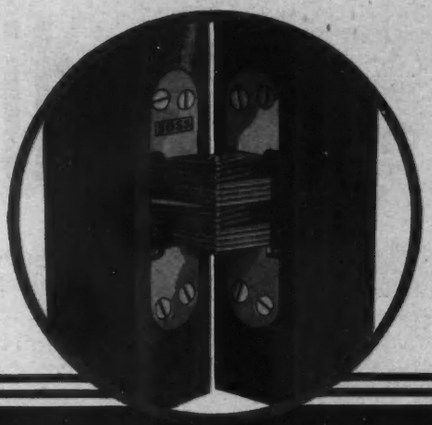

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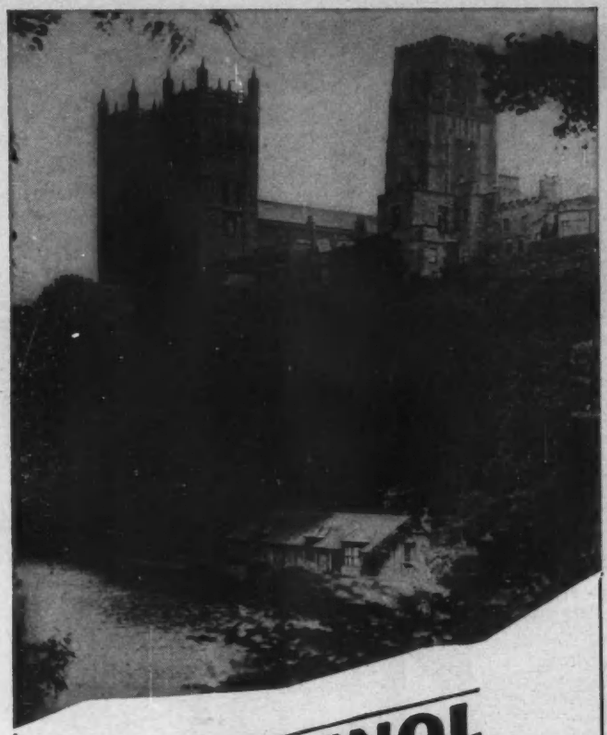

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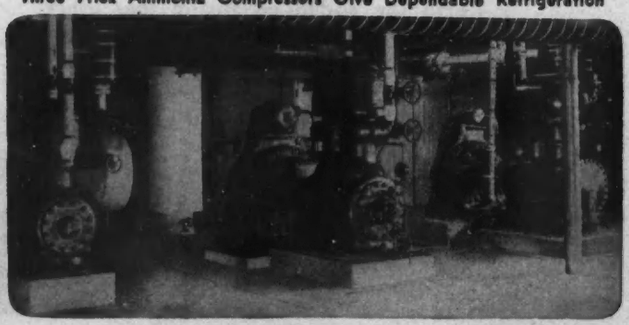

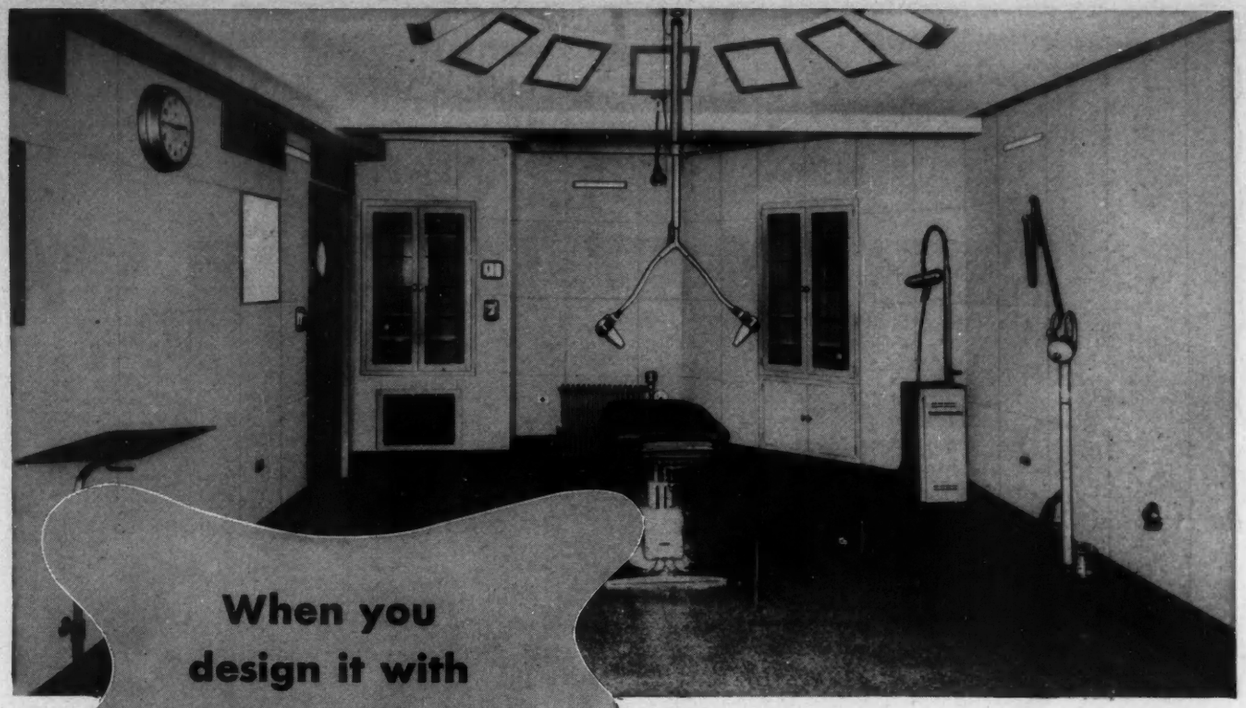

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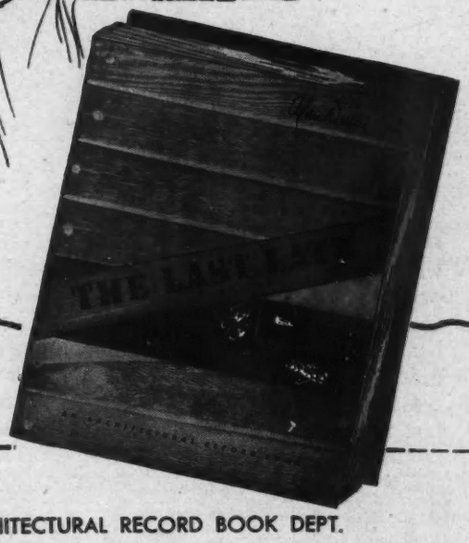

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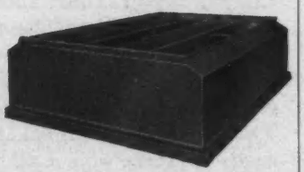

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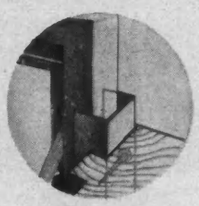

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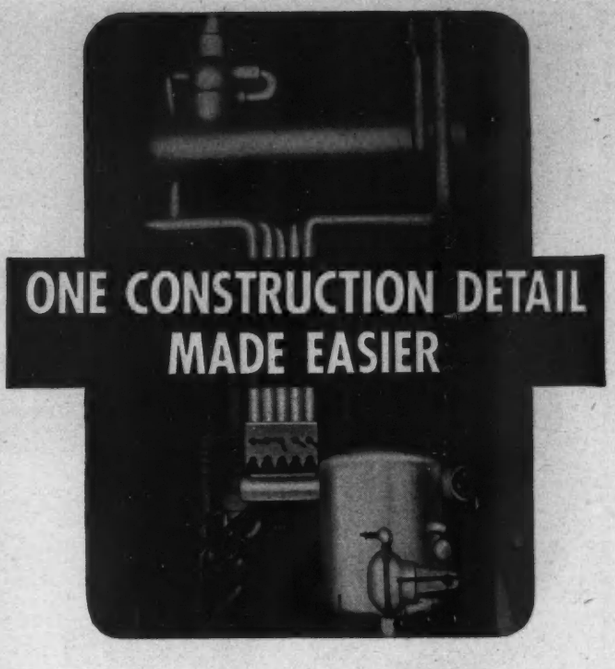

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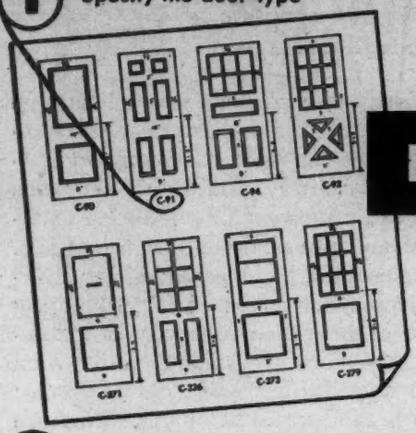

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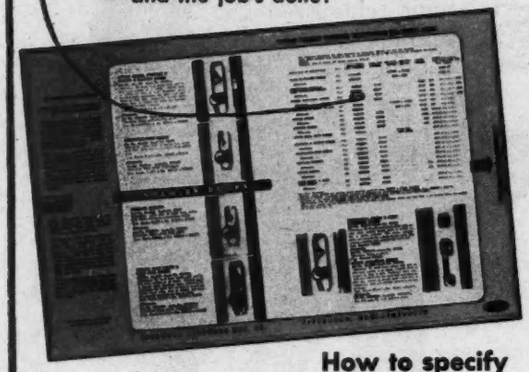

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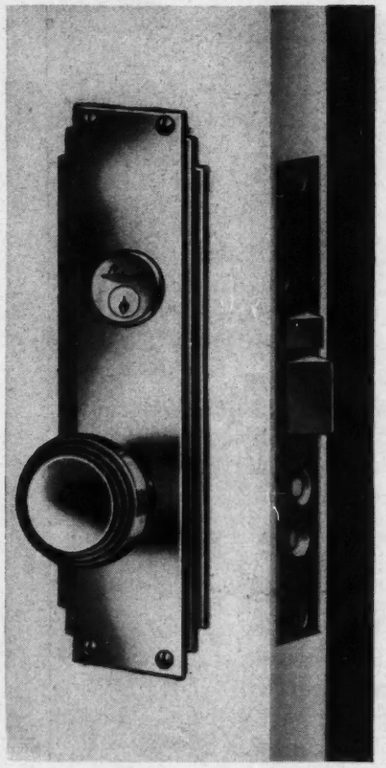

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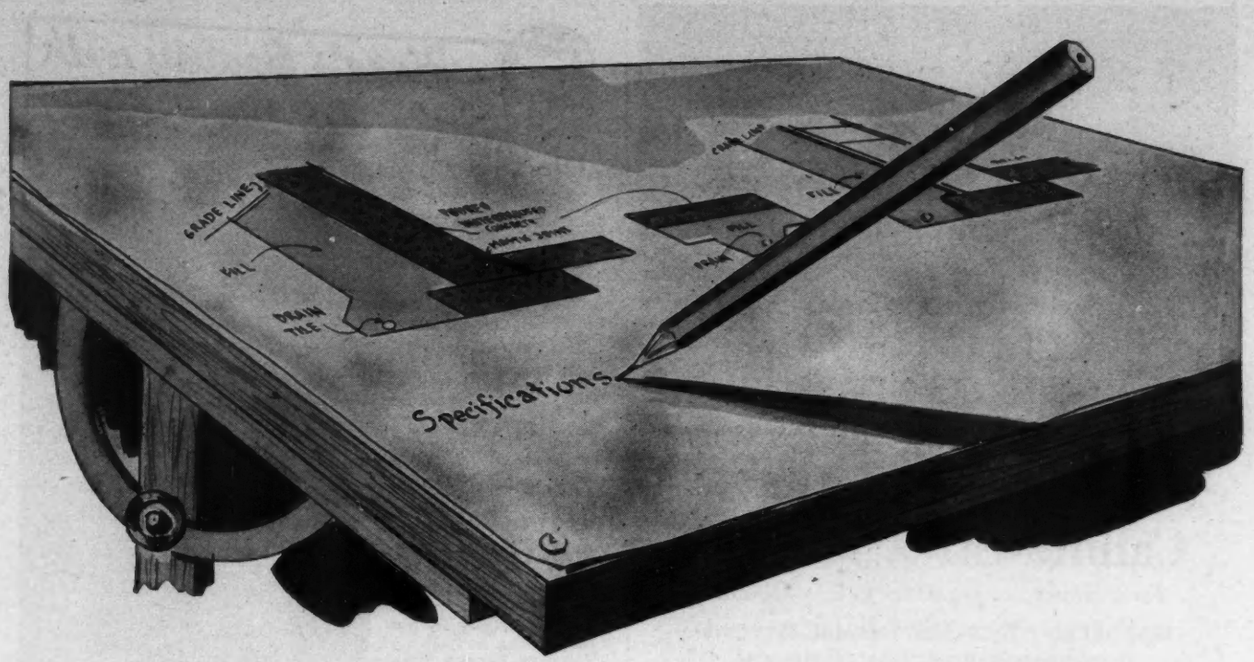

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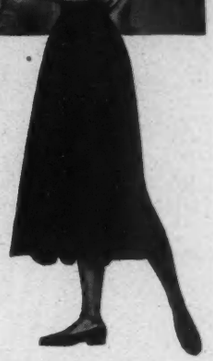

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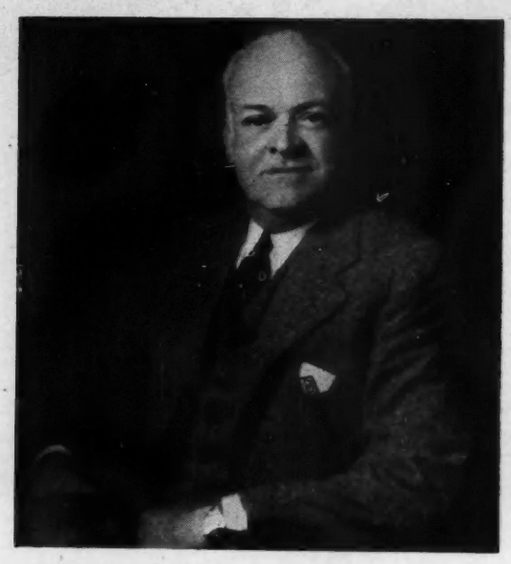

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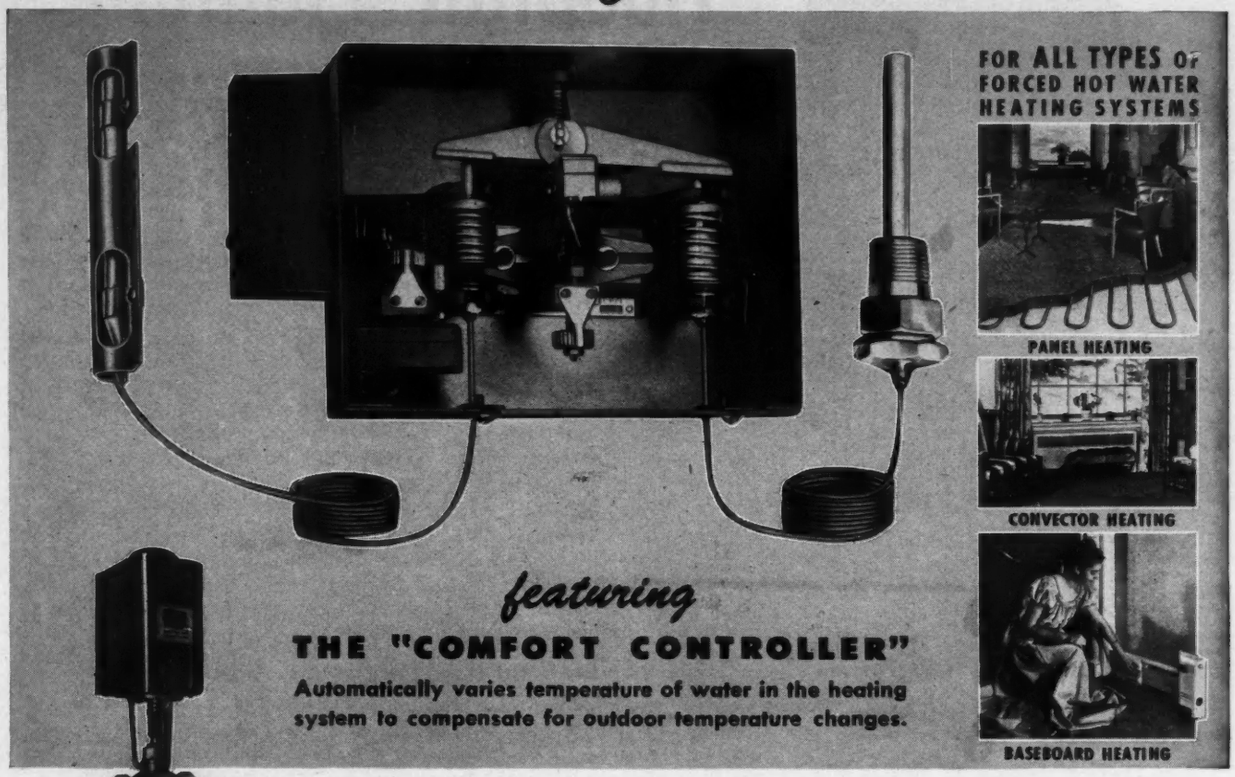

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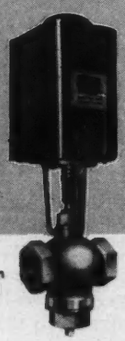

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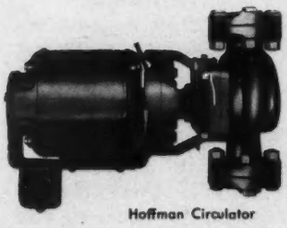

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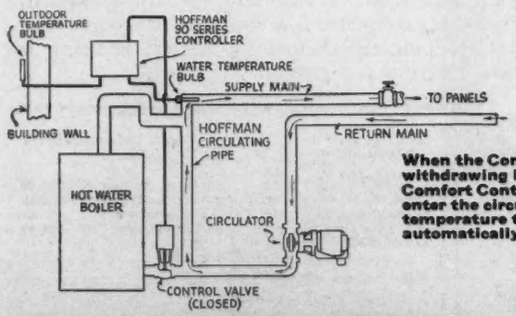

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HOSPITALS selected for illustration include — Cornell-New York Medical Center, New York; Goldwater Memorial Hospital, Welfare Island, New York; Methodist Hospital, Brooklyn; General Hospital, Cincinnati; Saint Vincent's Hospital, New York; Community Hospital, Battle Creek; Saint Mary's Hospital, Rochester, Minnesota; American Memorial Hospital, Reims, France; Mallinckrodt Institute of Radiology, Saint Louis; Royal Victoria Hospital, Montreal; Rochester Municipal Hospital, Rochester, New York; Potts Memorial Hospital, Livingston, New York; Fort Sill Hospital, Fort Sill, Oklahoma. Saint Luke's Hospital, Spokane, Washington; Massachusetts General Hospital, Boston and many more.

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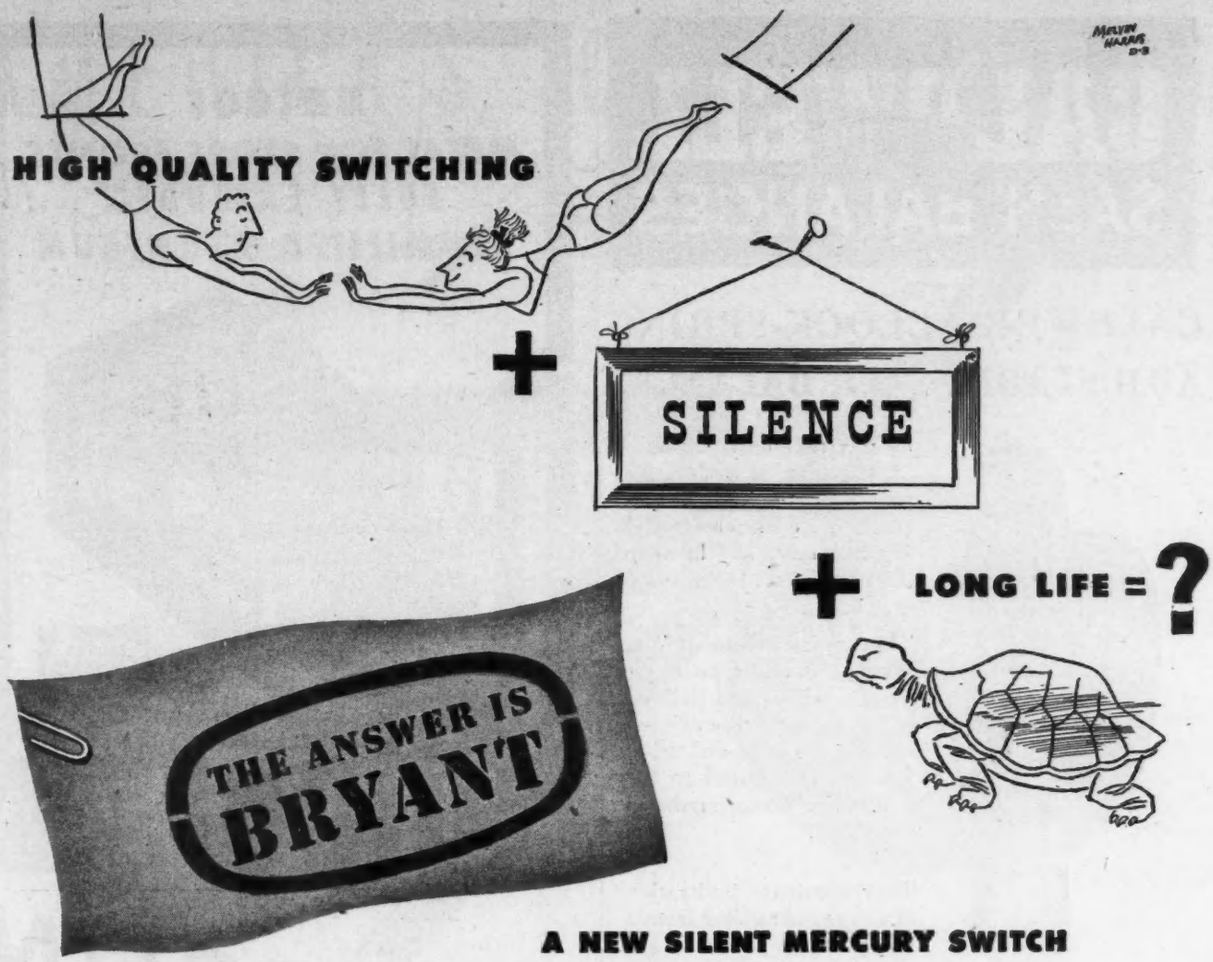

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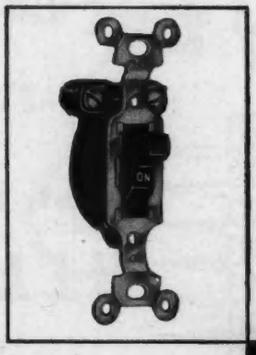

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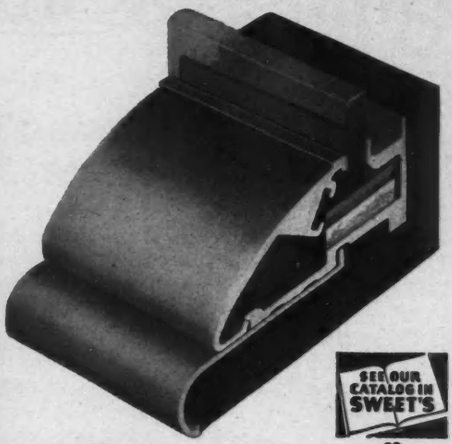

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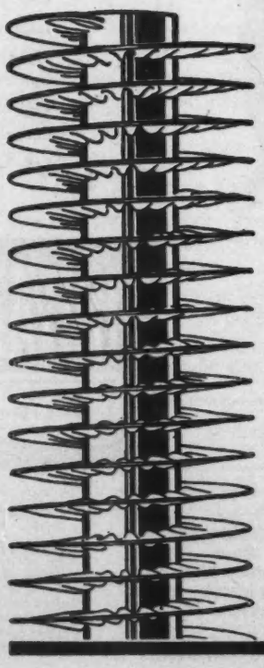

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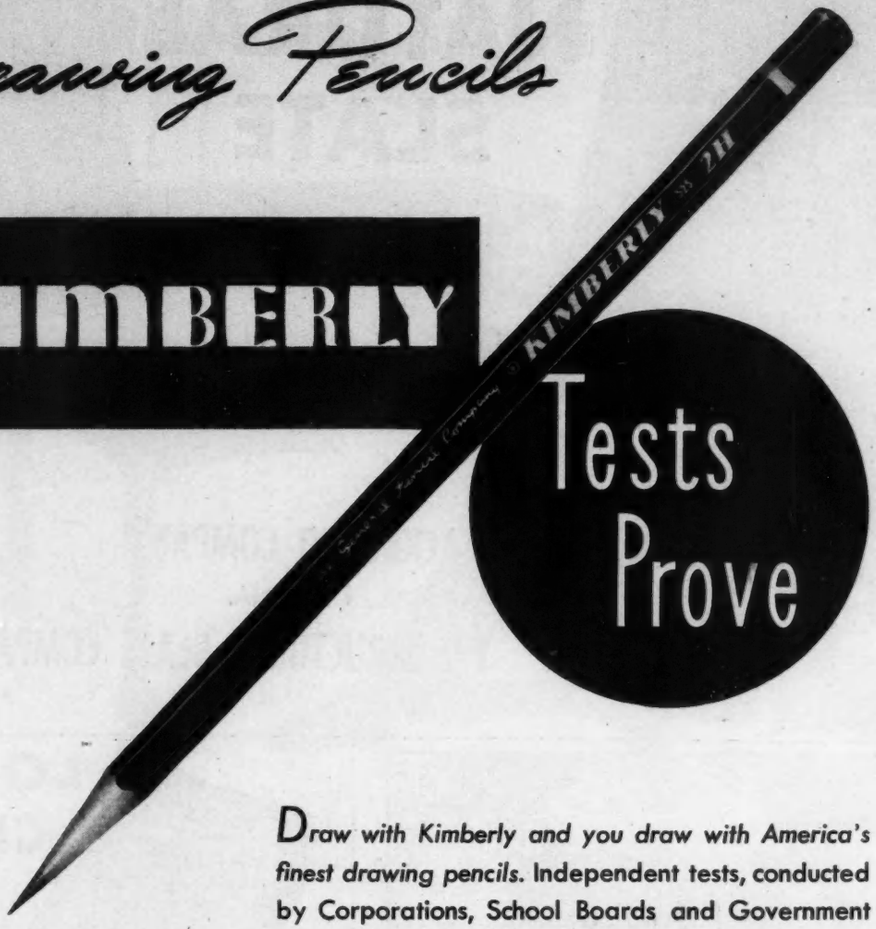

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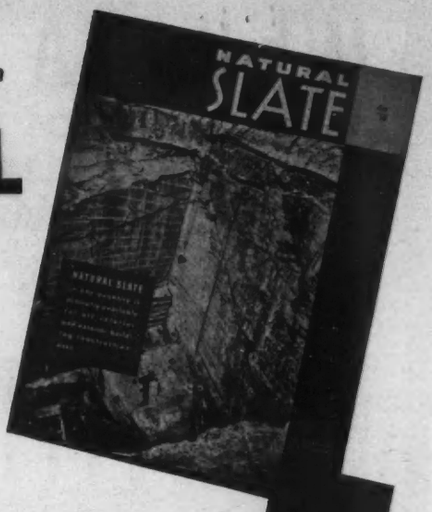

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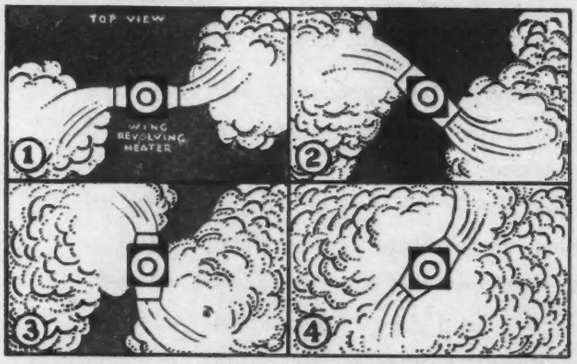

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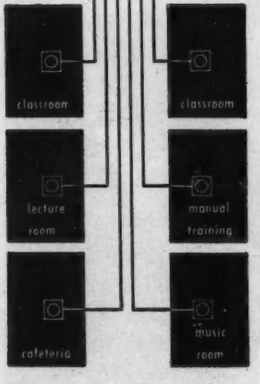

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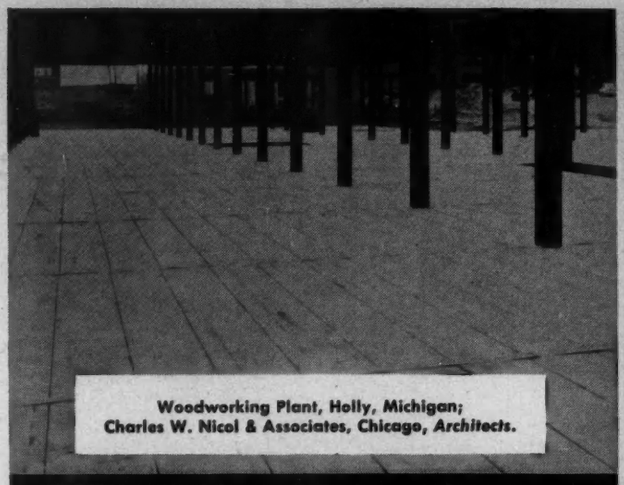

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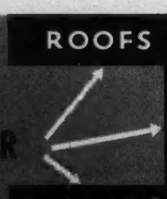

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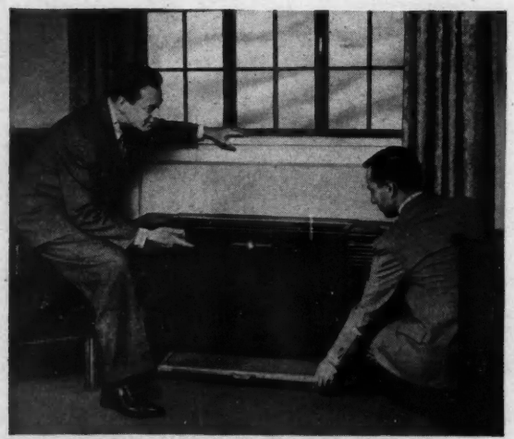

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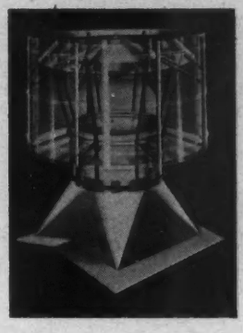

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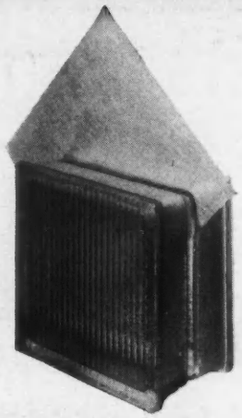

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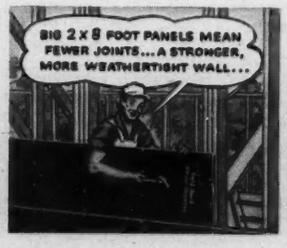

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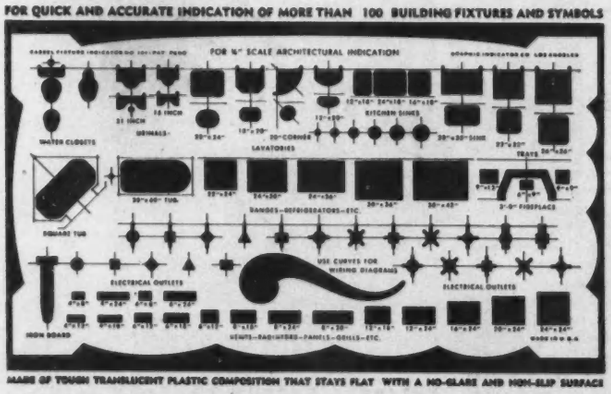

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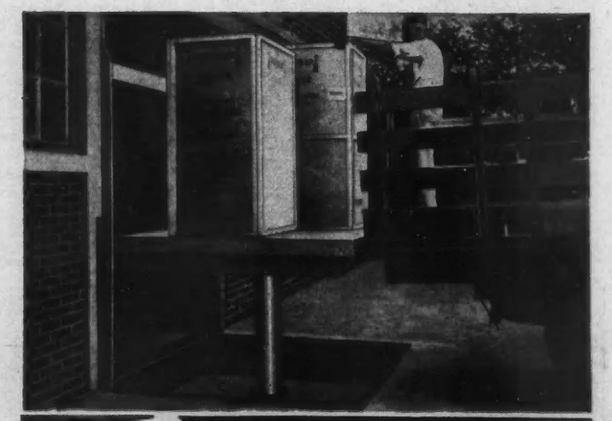

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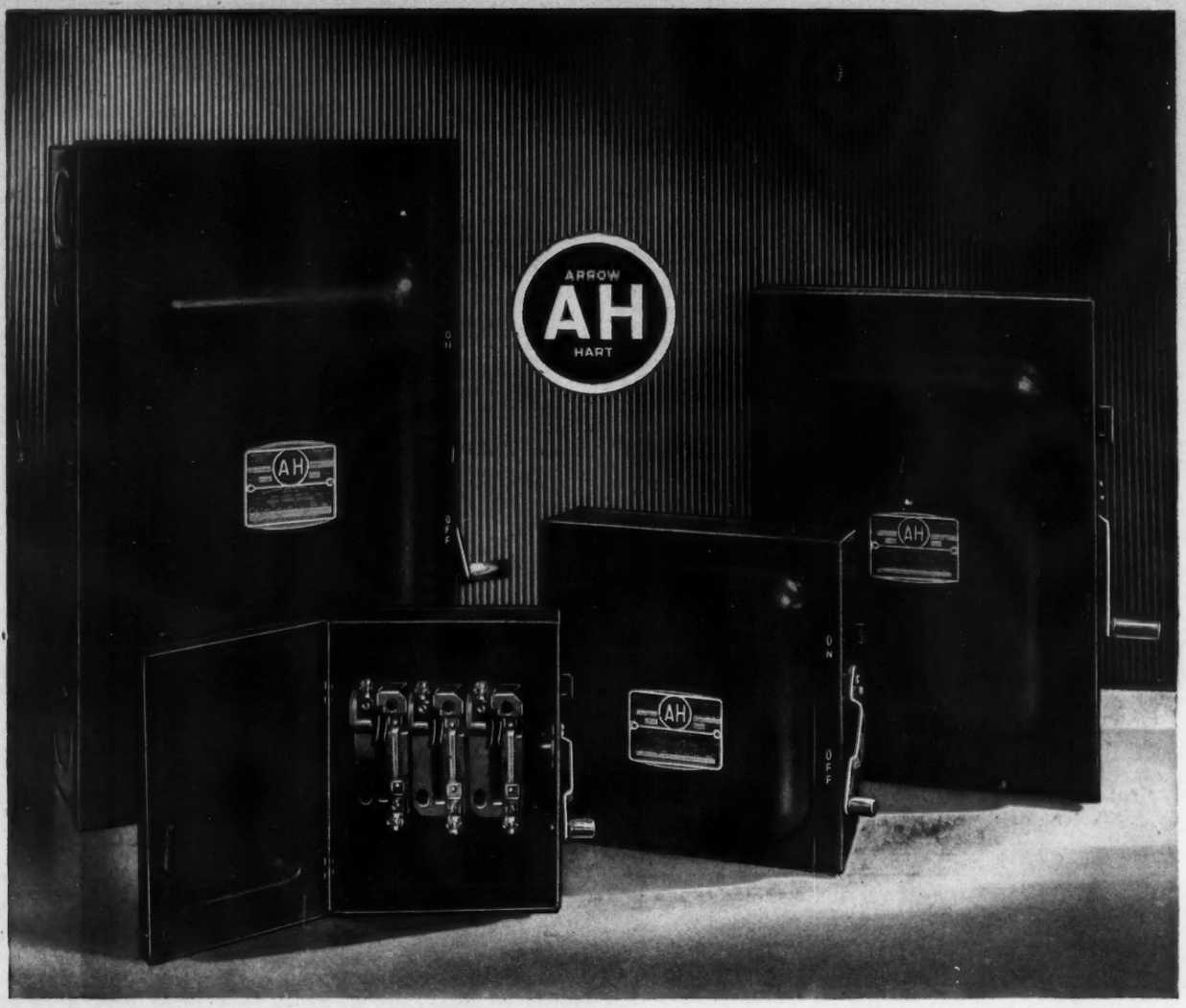

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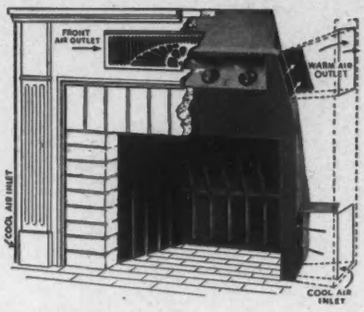

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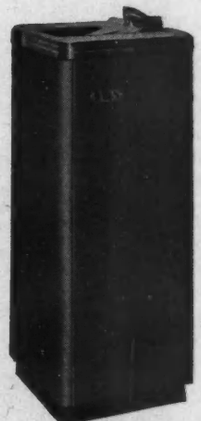

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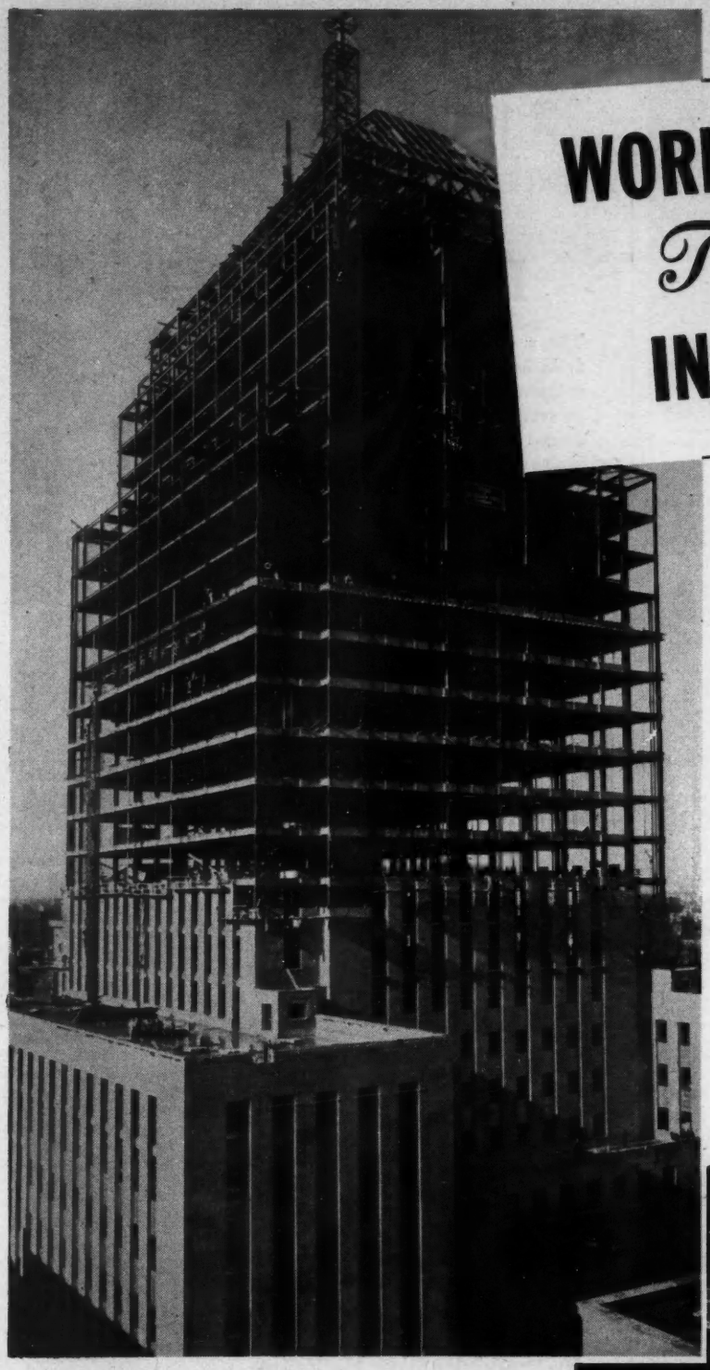

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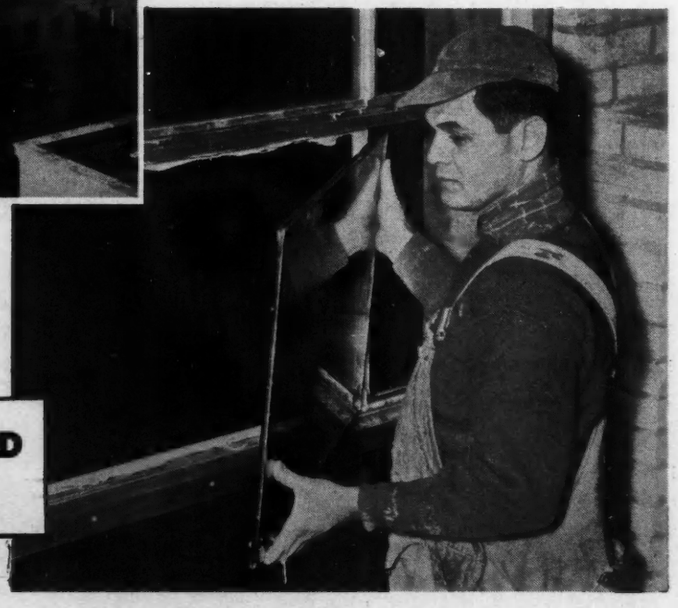

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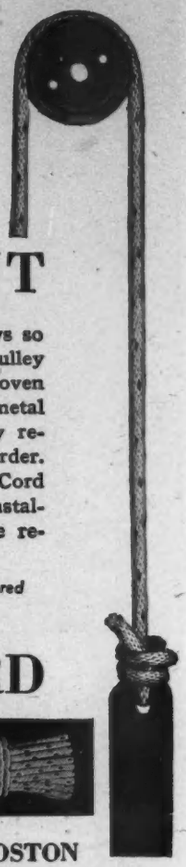

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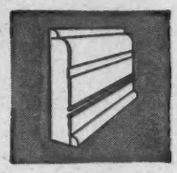

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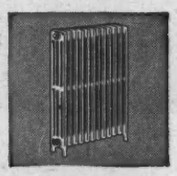

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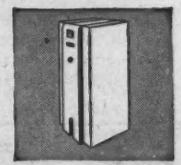

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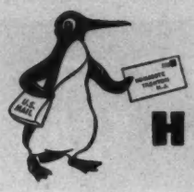

HOMASOTE
gets a letter

Long Branch, New Jersey
October 22, 1947.

President
Homasote Company
Fernwood Road
Trenton, New Jersey
Dear Sir: —

I am one of 56 men who constructed and then lived in the Byrd Expedition buildings (at Little America, Antarctica for over a year in 1934-35) which were assembled from Homasote lined sections left over from the establishment of the first Little America in 1929. These sections were already the veterans of five years' storage in damp New Zealand warehouses, but were still so strong and easy to saw, fit, and assemble that we were considerably surprised. But when we had dug down to the old camp and found also that the Homasote in the original buildings was in perfect condition after one year of soaking in melted snow (1929-30) and five years under the terrific pressure of 20 feet of ice, we were completely sold. When other wallboards would have pulped, cracked or dissolved, Homasote remained firm and trustworthy insulation against blizzards and temperatures to minus 75!

I am not in the habit of using my few leisure hours to throw bouquets, I have too much to do, but I feel that merit deserves reward, so here goes — believe it or not, the above remarks are paled into obscurity by my present opinion of your fine product. When, as a technical observer, on the recently concluded Navy "Operation Highjump", I was one of the few who were privileged to dig down 12 feet to our old home 10 miles from the newest camp-site. I found the 18 year old Homasote in the walls and ceilings of the "Messhall" and "Science Lab" (the only buildings we could reach) absolutely unharmed by time, water, or cold. Hundreds of tons of ice had forced up the wood floors and pushed down the ceilings until they met in the center of the rooms, and puddles of ice everywhere evidenced the repeated freezing and thawing of the many seasons, but the *walls* were *straight, unbuckled* and *scarcely stained.*

Later, when our Expedition was leaving for its return to the States (February, 1947) and I had occasion to make one last run to the old camp to mark the entrances against the future, I hacked out a piece of the messhall wall to send to you for analysis. I am mailing it to you for whatever purpose you may wish to use it, and if you ever want me to convince some doubting customer of yours, just lead me to him. At least I can assure you that when at last I build the home I've been planning throughout several years of roaming the world, the insulation will emphatically be Homasote.

Yours sincerely,

Amory H. Waite, Jr.
Radio Engineer
BAE II 1934-35 and 1946-47

P.S. I forgot one item. When I was carrying your specimen up the rope ladder from the whaleboat to the ship, it fell out of my pack and drifted away to sea. To my amazement its generation-old waterproofing qualities were still intact for it kept floating! Another boat speared it with a boat hook an hour later and returned it to me, punctured, but still definitely useable wallboard. The hole, therefore, is a badge of honor rather than a defect.

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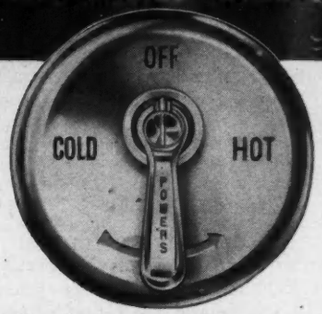
Type H
THERMOSTATIC
SHOWER MIXERS



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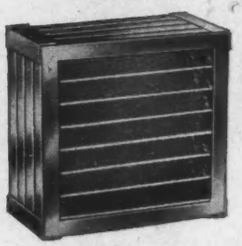

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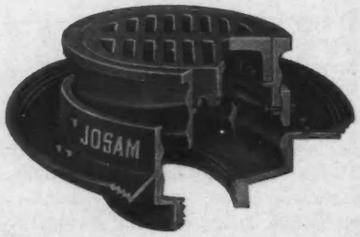

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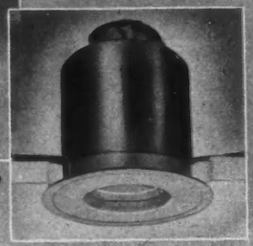

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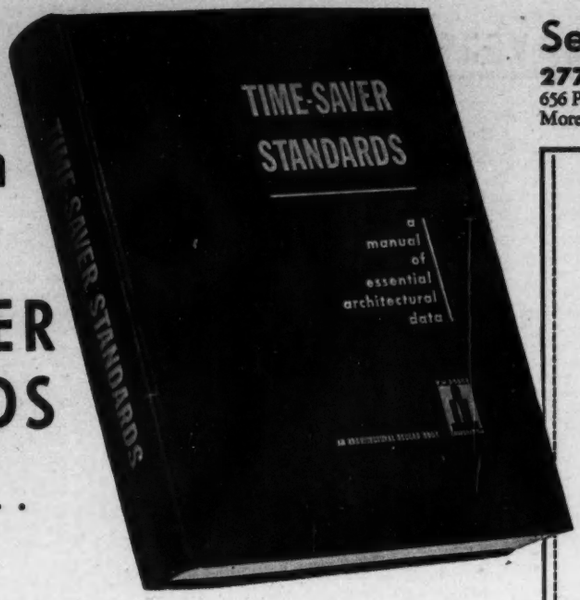

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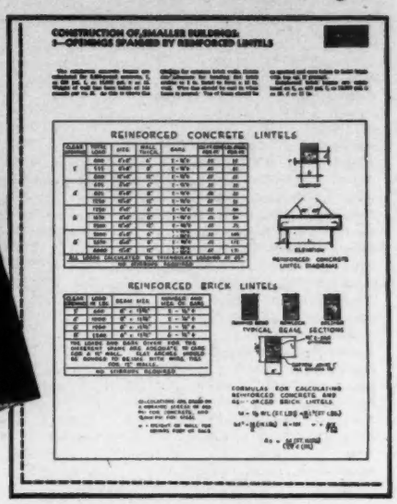

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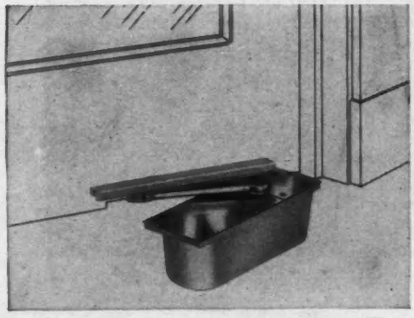
Weather—Floor Dirt—Scrub Water: 3 Enemies of all Floor Type Door Closers

You can avoid trouble with them, save substantially on costs and get better performance by using LCN Overhead Concealed Closers



Even the best floor type door closers suffer because of their location

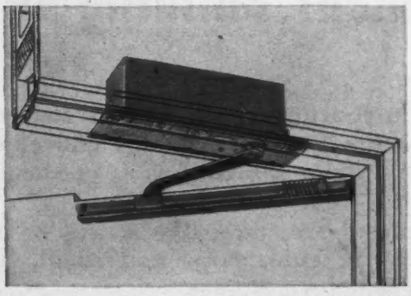
In recommending Overhead Concealed Door Closers instead of the Floor Type we have no prejudice whatever. LCN Floor Type Closers are fine, highly effective pieces of equipment. Thousands have been in service for years, doing as well as a floor closer can. But they have to take daily punishment that shortens the life, and increases the cost, of ANY mechanical device.

Floor closers fouled by dirt and water

Water and dirt from weather, from traffic, from frequent mopping of floors always seep down into a closer box below floor level, eventually ruining the precision machine in the box. You can avoid this by specifying LCN Overhead Concealed Closers, hidden in the head frames over the doors.

Floor dirt and water just can't reach the closer placed above the door

This closer is kept clean and dry, year in, year out, as moisture and dust are practically excluded. Nearly 20 years of widespread use have proved the complete soundness of the idea.



Overhead closer is more effective

Because an overhead closer can't interfere with foot traffic it can be mounted much farther out from the hinge side of the door than the floor type. This gives it far better leverage, less strain on the mechanism, longer life, lower maintenance cost.

The Overhead Concealed Closer is simpler to install, easier to move and to keep in working order

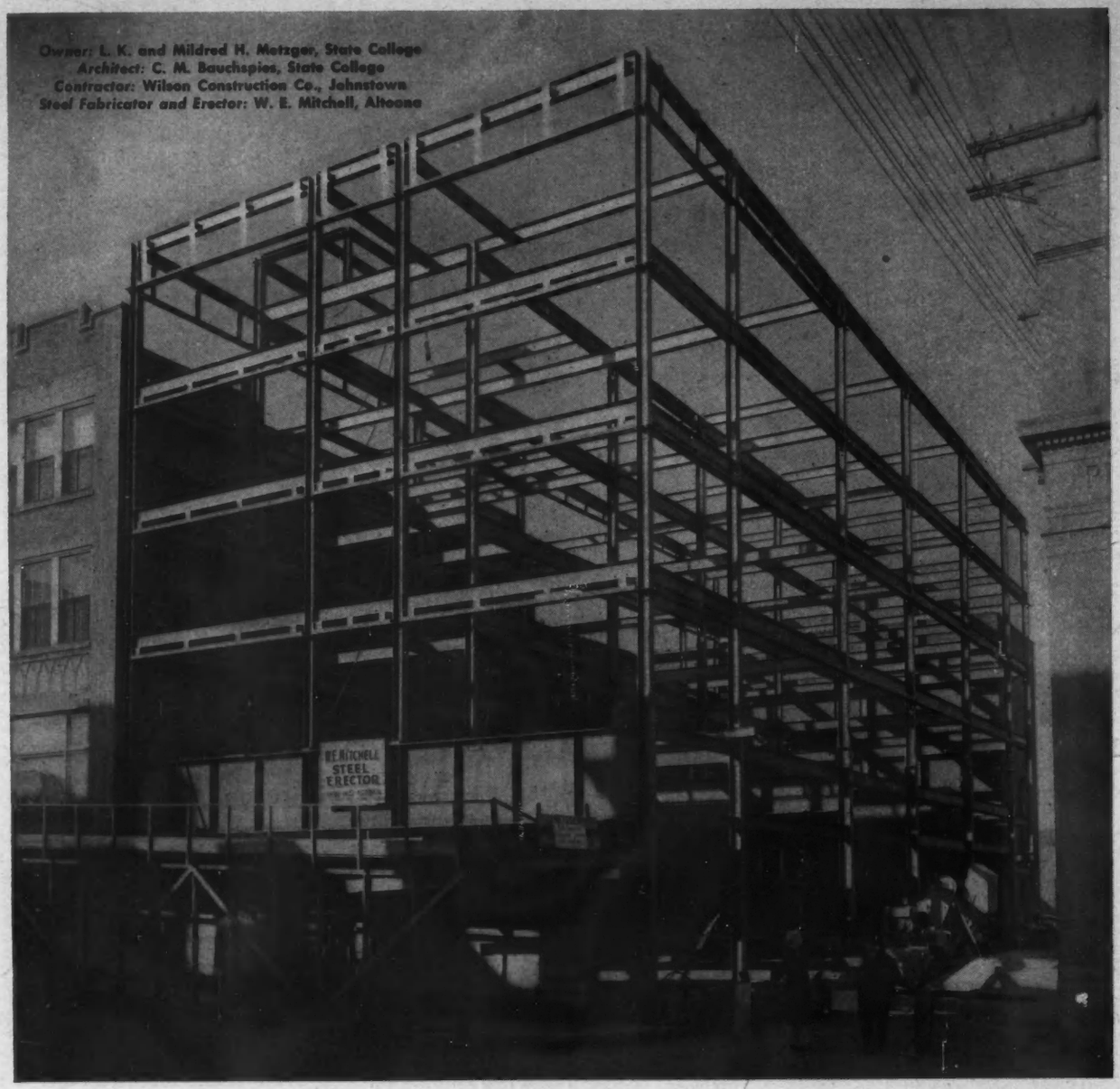
The overhead concealed closer is easily secured in an opening prepared in the head frame (wood or metal). No chiseling of floors; no guesswork as to location; no interference with pipes or conduits. When a partition wall moves, the door and closer go with it. No boxed or cut thresholds needed. Job costs (and total costs) are kept down. Adjustments easily made without removing anything. Closer delivers long, efficient service.

Send for latest information

The LCN catalog 11-a is really a handbook of good door control, showing applications of 10 types of concealed closers; principles of operation, getting needed leverage; types of exposed closers, etc. We'll gladly send you a copy. No obligation. Address LCN, 466 W. Superior St., Chicago 10, Ill.

LCN

Overhead and Floor Type Concealed *and* Surface Type Door Closers


Owner: L. K. and Mildred H. Metzger, State College
Architect: C. M. Bauchspies, State College
Contractor: Wilson Construction Co., Johnstown
Steel Fabricator and Erector: W. E. Mitchell, Altoona
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New Store-Apartment Building at State College, Pa.

Metzgers, dealers in sporting goods, books, stationery, etc., now occupies the entire first floor of this conveniently located semi-apartment building, shown during construction at State College, Pa.

The recently-completed structure, like scores of other buildings now under way in cities large and small, has a framework of Bethlehem Structural Shapes.

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